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WEEDS TREES & TURF

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Interior Plantscaping: Becoming Big Business

Bucket Lifts vs. Climbing for Tree Maintenance

ISSN 0043-1753

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WT&T

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JOHN DEERE
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John Deere, as everybody knows, is a place you go for tractors.

What do you think of when you think of John Deere?

Probably not air compressors. Or alternators. Or high pressure washers.

But the fact is, your John Deere dealer carries a good many products you don't ordinarily associate with John Deere. Products that grounds care and construction people use all the time.

For example, we have a whole line of skid-steer loaders, ranging from 14 hp to 37 hp, for handling big jobs in confined areas.

We have portable power equipment like alternators, air compressors, battery chargers, welders, space heaters and pumps.

We have snow blowers for clearing away snow, backpack blowers for cleaning up leaves and debris, and high pressure washers for washing trucks or trailers.

And we have a whole line of power equipment for lawns and gardens: tillers, lawn mowers, nylon line trimmers, edgers and chain saws to name just a few.

We even have electronic bug killers. And a long list of other items not shown in this ad: carpenters' tools, mechanics' tools, lawn and garden tools, etc.

And needless to say, we have tractors. From 8 hp to 50 hp. With a wide choice of matching implements to go with them.

Next time you're looking for equipment, of almost *any* kind, visit your John Deere dealer.

Chances are he'll have what you're looking for.

And when you buy from John Deere you can be sure of the quality. Plus parts and service when you need them.

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WT&T OUTLOOK

The interior landscape industry has grown up and has assumed its well-earned position in the Green Industry. Its challenges in improving materials and techniques for indoor plant displays will certainly fill pages in future issues of Weeds Trees & Turf. There is always excitement and curiosity when a related horticultural field does well. Even though everyone may not participate in that market, it can add a new dimension to our own personal store of information on the science we live by. It makes my job as a journalist as interesting as a newspaper reporter covering a major fire. Hopefully, the interior landscape market and our coverage of it will keep you reading this magazine for the latest trends and news on our Green Industry.

Beginning in the next one or two issues, we will begin offering technical assistance on tropical and semitropical plant problems. This will round out our present technical assistance through the Vegetation Management column and monthly technical features. We hope you'll take advantage of our offer to help you, no matter what area of the Green Industry your question concerns. Don't forget, one of the cards stuck in every issue is designed just for your questions and comments.

WT&T LETTERS

Your stab at the Green Industry in the 1980's is very exciting, challenging and useful. It represents a lot of hard work and thought.

Congratulations! I hope your readers study the article and profit by it. I can assure you that I will.

C. Edward Scofield
Executive Vice-President
Ra-Pid-Gro Corp.
Dansville, NY

Ed has written market forecasts for magazines such as Flower and Garden and Horticulture. He has been part, not merely an observer like me, of professional landscape horticulture for many years. The opportunity is in our markets, we've got to go after it, it won't come to us. Thank you for your support Ed.

In the Vegetation Management section of the November issue there was a question concerning weed control in a garden center. Here in Arizona we are finding a woven polypropylene fabric called ProPak ground cover to be superior to black plastic for weed control in nurseries and garden centers. The fabric does not disintegrate in the heat as does polyethylene. Water can seep through it, it resists tearing, and it doesn't become slick when wet

Interested persons can contact Pak Unlimited, 2965 Flowers Rd., South, Suite 105, Atlanta, GA, 30341

W.D. Murphy, Jr.
Agric. and Diversified Prod.
Scottsdale, AZ 85253

Congratulations on landscape emphasis in your magazine. The article on street trees by L.E. Phillips, Jr., in the Dec. 79 issue might be enlarged to include urban street tree planting and community cooperation with local park department maintenance forces in watering, weeding, reporting damaged trees, removal of litter, etc. I've learned that placing the walks next to the curbs helps solve salt and utility problems. Planting trees inside of the walks gives the trees better protection from cars, buses, trucks and the pollution associated with them.

A.F.
Landscape Architect CT

Thank you for your suggestions. The best contribution this magazine can make is to serve as a place to exchange ideas and advice. We'll proceed on an article on street tree planting and cooperation with public agencies as you suggest.

Thank you for the opportunity to receive your magazine. My students and I appreciate the up-to-date information on parks and golf course maintenance plus equipment maintenance tips.

L.B. Instructor
Rolkum, CA

I'll repeat it for those who didn't see our offer in the last issue. Instructors of programs relating to the Green Industry are entitled to a complimentary subscription for reference purposes. At the same time we offer a half-price subscription rate for students, extended one year following graduation. We want our future businessmen and women to benefit from our efforts throughout their learning and earning lifetime.

GREEN INDUSTRY NEWS

EQUIPMENT

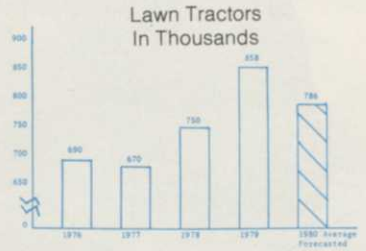
Shipments of equipment to decline

The average forecast of 21 companies who responded to an industry outlook survey by the Outdoor Power Equipment Institute is for an overall 5 percent decline in selected industry shipments for the 1980 model year, which began Sept. 1, 1979.

With the exception of rotary tiller shipments, which are expected to remain about the same, the projections indicate a decline in shipments of walk-behind mowers, lawn tractors/riding mowers, and garden tractors.

Shipments of walk-behind power mowers are projected at 5.6 million units, a 5 percent decline from 1979's estimated 5.9 million units. Lawn tractors/riding mowers are expected to decline by 12 percent to an estimated 786,000 units, while a 10 percent decline to 228,000 units is seen for garden tractors. Rotary tiller shipments are expected to increase slightly from 1979's estimated 571,300 units to 572,500 units in 1980.

The major economic indicators relevant to the lawn and garden industry support these projections. The consumer price index should increase 10 percent in 1980 while the gross national product (in 1972 dollars) should increase a mere 1.9 percent. Housing starts should be 1.5 million, the unemployment rate at 7 percent, and producer prices for finished goods at 10.5 percent.



Data from Outdoor Power Equipment Institute.

FORESTRY

Congress approves urban forestry program

Congress has passed the Urban Forestry Assistance Program, which is appropriated for approximately $3.6 million for fiscal year 1980.

The bill is subject to annual appropriations and keeps urban forestry with about the same funds it received in 1978, when the Cooperative Forestry Act of 1978 was passed.

The Senate Appropriation Act had originally scheduled zero dollars for urban forestry, but the House had passed the same amount as in 1979, says Richard Greffenius, a forester at the Forest Service. When it went to conference committee, the Senate resolved its differences and agreed with the House appropriation.

The President, in an attempt to cut his budget, had also not recommended money for urban forestry. All of the interested parties, including the American Forestry Association, the International Society of Arboriculture, and the National Association of State Foresters, contacted congressmen who serve on the committee that has jurisdiction, committee staff people, and whoever else was involved.

Money for the program has risen slightly from the 3.5 million in 1978 to slightly more than $3.6 million for fiscal year 1980, but some of this will be taken out for a travel reduction. The Cooperative Forestry Assistance Act has a section that requires state forestry agencies to get at least what they received in 1978. The state foresters, themselves, agree they would like to get an even share of increases or decreases, says Greffenius.

Approximately 90 percent of the appropriated money goes to state forestry agencies. They can use it within their agencies or subgrant it to cities, towns, organizations, or individuals who qualify for it as long as they spend it toward the purpose of the act.

ACQUISITION

American Garden to merge with Amfac

American Garden Products, Boston, MA, has agreed to merge with Amfac, headquartered in Honolulu, subject to approval by American Garden's stockholders.

Amfac, a New York Stock Exchange company, is involved in a diversity of activities which includes the production and marketing of horticultural products. American Garden's Board of Directors determined that Amfac's strong ties to production, wholesale distribution, and retail merchandising would be helpful to American Garden's operation.

TURF

Study shows effects of cold on bermudagrass

A study done by two agronomists at Virginia Polytechnic Institute in

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Immaculate weed-free turf not only looks better, it also costs less.

Read how Trimec® Turf Herbicide can save you time and money, and make your work more fun.

It costs less to go first class. How many times have you heard that old truism? You know it's a fundamental fact of everything in life, but in no other phase of today's economy is it more graphically demonstrated than in the world of weed control in professional turf management.

When a turfman tries to skimp along with a narrow-spectrum herbicide on the theory that it will control the major eyesores like dandelions and chickweed, and will cost less per gallon than Trimec — he opens the door to an endless chain of problems and expenses.

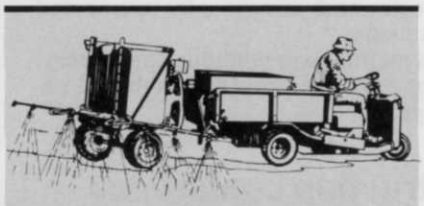
Perhaps the worst consequence is the emergence of some ugly weeds of the hard-to-kill variety that he once considered to be so rare that he didn't even think of them as a problem in his area. And, when these weeds come, they come as a crowd... out of nowhere.

Of course, you know where they came from and why they came. They're the natural consequence of using a narrow-spectrum herbicide in an area that is fertilized and watered.

The hardy weeds (which were not controlled by the narrow-spectrum herbicide) are nourished by the fertilizer and water, and fight with the grass to fill the vacancy left by the demise of the sensitive weeds. Some of them win, and weeds that were once obscure become prominent.

There's really only one efficient way to cope with the problem, and that is the Trimec way.

Trimec is the one turf herbicide with a broad enough spectrum to get those hard-to-kill weeds right along with the common, sensitive ones. How many species of broadleaf weeds will Trimec control? We are still looking for the economic broadleaf weed that Trimec will not control when applied at the right times and rate. If we ever do find such a weed, we will be very surprised. No other selective herbicide can match the broad spectrum of Trimec.



How many species of broadleaf weeds will Trimec control?

We are still looking for the economic broadleaf weed that Trimec will not control when applied at the right times and rate. If we ever do find such a weed, we will be very surprised. ***No other selective herbicide can match the broad spectrum of Trimec.***

Yet, with all this power, Trimec is friendly to the environment in terms of safety to grasses, because no ingredient in Trimec is at a phytotoxic level.

And when you get to the bottom line, Trimec is less expensive than its less-effective contemporaries because it requires less chemical per acre for maximum weed control, and it saves labor costs because it does it right the first time so you don't have to do it over. Thus, when you use Trimec, you not only look good to the greens committee... you also look good to the finance committee.

Only Trimec gives you all of these benefits

- Controls the widest range of broadleaf weeds
- Gets hard-to-kill species with one treatment
- Wide safety margin for lawn grasses
- Minimum hazard from root absorption
- No vapor action after application
- Effective weed control in wide temperature range
- Unique formula overcomes water hardness problems
- Treated areas may be seeded within two weeks
- Non-flammable and non-corrosive in use
- Product stable several years above 32° F.
- Biodegradeable; friendly to the environment
- Bentgrass formula also is available.

In summary

The Trimec record speaks for itself. No other turf herbicide available today is the equal of Trimec, not only in providing superior broadleaf weed control, but also in terms of safety to grasses — and in total cost. No wonder an overwhelming majority of golf course superintendents agree: *Dollar for dollar and acre for acre of immaculate, weed-free turf, Trimec is the most efficient broadleaf herbicide on the market ... period.*

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LANDSCAPE CONTRACTOR NEWS

Californians plan first landscape show

The first annual Landscape Industry Show ever produced by the California Landscape Contractors Association has been scheduled for April 3-4 at the Long Beach Convention Center.

The show will feature the latest in equipment and plant materials for landscape and irrigation contractors, landscape maintenance contractors, nurserymen, landscape architects, and anyone else connected with or interested in the landscape industry.

The event will also contain exhibits on business methods, machinery, and products to help the industry cope with the rapid growth and expansion it has experienced in recent years.

ALCA will lobby at construction conference

The Associated Landscape Contractors of America, co-sponsors of the 1980 Construction Industry National Legislative Conference, hope to influence the Federal government on a number of important issues at the three-day meeting.

The program, which will be held at the Sheraton Washington Hotel, Washington, D.C., on March 16-18, includes workshops on equal employment opportunity, collective bargaining, pension law, labor legislation, multi-employer certification, and the role of the Federal government in aiding small business. Senators, Representatives, and high-ranking officials of the executive agencies will speak.

"Our overall intent is lobbying," says John Shaw, executive director of ALCA. "We hope to influence the governmental environment in which landscape contractors operate, and secondarily, make members more aware of the governmental environment they work in and more aware of what influence they can have on it."

Blacksburg, VA, indicates that below-freezing temperatures and prolonged dormancy may hinder the survival of bermudagrass. The laboratory tests also showed that short deacclimation periods before freezing may lessen winter injury in the field.

D.R. Chalmers and R.E. Schmidt investigated the effects of deacclimation, freezing temperatures, and duration of dormancy after exposure to freezing temperature on 'Tifgreen' bermudagrass. They deacclimated the grass from zero to eight days at 27/13 degrees C. (day/night), subjected rhizomes and stolons to temperatures of +2 to -6 degrees C. for 24 hours, and kept one-third of the samples in dark storage for 0, 45, and 90 days at about 2.7 degrees C.

Prolonging dormancy after exposure to low temperatures reduced the viability of both stolon and rhizome node buds. This suggests that continuation of the dormant condition on into spring could be an important contributing factor to the decrease in winter survival of both bermudagrass rhizome and stolon buds.

SALES

Toro reports quarter of $101.6 million sales

The Toro Co. has announced record first quarter sales for the period ending Oct. 31, 1979. Its earnings of $101,596,000 are an increase of 52.8 percent over the same quarter last year.

Toro Chairman David T. McLaughlin said a 59.6 percent increase in sales of snow removal equipment was a major factor in the quarter. Sales of snow removal equipment in the first quarter accounted for 64 percent of total sales, consumer lawn equipment for 18 percent of the total, professional turf equipment for 9 percent, and irrigation equipment for 8 percent.

HERBICIDES

Devrinol labeled for ornamentals, liners

Devrinol, a surface-applied herbicide, has been federally registered for weed control in ornamentals, field-grown nursery stock, liner stock, ground covers, and dichondra.

The Stauffer Chemical Co. product has been labeled to control eight annual grasses, including barnyardgrass, bristly fox-tail, and large crabgrass, as well as 12 annual broadleaf weeds, including common purslane, lambs-quarter, and redroot pigweed.

It can be applied as a broadcast treatment over young nursery stock or as a directed spray to larger stock either as a band or broadcast application, and is recommended on several different container potting soil mixtures. Application can be made any time of the year to weed-free soil.

WEEDS

National program hits weeds from every angle

The multidisciplinary National Research Program is designed to develop weed control technology that will reduce the losses weeds cause and the cost of their control.

The research is organized into 122 projects at 45 locations and is conducted by 64 scientists in cooperation with several Federal agencies, State Agricultural Experiment Stations, private universities, and industrial research organizations.

During the decade 1977 to 1986, the technology form this program is expected to produce total net benefits that include:

1. Reduction in the crop losses caused by weeds from 10 percent to seven percent resulting in an annual savings in production valued at $2 billion.

2. Reduction of 10 percent in the current cost of weed control resulting in a net annual savings of about $620 million.

3. Improvement in the quality of crops by one percent resulting in a net increase crop value of $600 million per year.

4. An increase of four percent in crop production efficiency valued at an estimated $2 billion each year.

5. Reduction of 4 to 8 billion gallons per year in diesel fuel re-

We put a lot into our Turf-Truckster.

One of the most dependable vehicles for moving your crew around is the 3- or 4-wheel Cushman® Turf-Truckster. But it was also designed for more than just transportation.

Equipped with an optional PTO and hydraulic system, both models accept a wide range of special, add-on turf maintenance equipment. So with just one Turf-Truckster you can haul, dump, grade, seed, spray, spread, top dress, aerate and more.

But there's more to a Turf-Truckster than versatility. There's a rugged 18-hp engine that's built to take on your turf. It comes with a standard 2 to 1 auxiliary transmission. A transmission built to allow a gear driven PTO to be attached directly to it. And common sense engineering makes the Turf-Truckster steer clear of the repair shop, too.

The 3-wheel model gives you the maneuverability of a tight 17′ turning circle, while the 4-wheeler has seating room for two. And it just takes minutes to add any of the Turf-Truckster's accessory pieces, thanks to Cushman's pin-disconnect system. No bolting, no hitching. Just snap two or three pull pins in place and you're ready to hit the turf.

If a good transportation/hauling vehicle is all you need, though, look at the Cushman Runabouts. There's an 18-hp two-seater, and a fuel-stingy 12-hp one-seater model. Both Runabouts are economical to own. And like any Cushman vehicle, they're built tough.

There's nothing like a Turf-Truckster or Runabout to get more work done, in less time and with less manpower. For a closer look at what goes into, or behind, a Cushman vehicle, return this coupon today. 80-CUT-2

Show me what you put into a vehicle, Cushman.

☐ I'd like a demonstration of the Turf-Truckster (3-wheel or 4-wheel). (Circle One)

☐ I'd like a demonstration of the Runabout (12-hp or 18-hp). (Circle One)

I'm interested in seeing these Turf-Truckster attachments: ☐ Aerator; ☐ Sprayer; ☐ Top Dresser; ☐ Grader/Scarifier; ☐ Flatbed/Dump Box; ☐ Cyclone Seeder/Spreader.

☐ Send me your new 1980 catalog.

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Address

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And a lot behind it.

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GOVERNMENT UPDATE

Law orders labeling of service containers

Regulations have been adopted in California to require that service labels include the identity of the person responsible for the containers, the identity of the pesticide byproduct or common name and concentration, and the signal word which describes the toxicity of the pesticide.

regulations for all service containers, those other than the original labeled containers that are used to hold, store, or transport pesticides or pesticide dilutions. In addition, the regulations require that a copy of the registered label be present at each mixing and application site where service containers are used.

In the case of spills or other contamination, the labels will permit prompt identification of the pesticide involved so that appropriate action can be taken to protect public health.

Tax credit program helps hiring unskilled

Mike Jones, owner of a professional landscaping and grounds maintenance company in Tacoma, WA, will be receiving tax credits for hiring employees who might not be able to find full-time work or have a chance to learn a valuable skill.

Jones has hired disabled people, ex-felons, and those without proven abilities for years in his Grow It Green business. The Employment Security Department in Washington State will now be giving him and other private employers tax credit for training and providing opportunities for people who need jobs and want to work.

The credit can mean a tax savings totaling as much as 50 percent of wages up to $6,000 for each eligible employee in the first year of employment. In the second year, the tax credits amount to 25 percent of that amount.

According to Dr. Eugene Wiegman, commissioner of Employment Security, the Targeted Jobs Tax Credit paperwork is straightforward in application. An eligible worker is given a voucher informing potential employers that he or she is a member of a "targeted group." When the person is hired, the voucher is endorsed by the employer and returned to the Employment Security Department. There are no other obligations or restrictions. Employers receive the tax credit directly through the Internal Revenue Service.

Targeted Jobs Tax Credit is a national program available in all states. Information on the Targeted Jobs Tax Credit is available from your state Employment Security Department or the local office of the Internal Revenue Service.

Strip miner group wins in land restoration suit

A federal judge in Abingdon, VA, has ruled that strip miners don't have to rebuild mountains after they remove coal from them.

In the early January ruling, Judge Glen Williams also declared unconstitutional portions of the U.S. Surface Mining Control and Reclamation Act that let the government halt mining and assess penalties without a hearing and that allowed anyone complaining the land was unsuitable for mining to stop the operation.

The Virginia Surface Mining and Reclamation Association filed the suit in 1978, claiming the federal government had overstepped its bounds.

Executive Director of the Virginia association, B.V. Cooper, said the ruling overturned three important parts of the 1977 federal law. The major gripe of strip miners was the provision that strip-mined land had to be restored to original contours. In many cases, that meant rebuilding mountains, Cooper said.

The federal government—the suit was filed against the Secretary of the Interior—is expected to appeal.

quirements by achieving optimum tillage for weed control in crop production. This would amount to an annual savings of $1.6 billion.

PARKS

Girl Scout cooky sales will build a forest

In the San Francisco Bay area, Girl Scouts are helping the park system when they sell cookies in the annual January-March sale this year.

The 1980 sale will fund a new forest of native California trees in the East Bay Regional Parks, the 40-parkland system stretching along the eastern side of San Francisco Bay.

The hope for this first year is for 150 new trees, each to be planted in the name of a Girl Scout who ranks among the top sellers, according to Linda L. Chew, director of development and public information for the East Bay Regional Park District.

The forestry project is being conducted in all five Bay counties — Alameda and Contra Costa, home of the Regional Parks, and across the Bay in Marin, San Francisco, and San Mateo counties.

HORTICULTURE

Research changes view on succulent growth

Cacti and other succulents grow better when watered and fertilized more frequently than generally done, say researchers at Cornell University.

Their findings run contrary to the popular belief that these plants do best in a desert-like environment. Good light is essential, but it does not have to be as intense as that found in the deserts, nor is it necessary to keep the temperature high at night. In fact, succulents do well at cool temperatures ranging from 50 to 60 degrees F. at night.

Since production may now be possible anywhere in the northern United States and in Canada, more exotic varieties of succulents may become available to consumers. Home gardeners can also benefit from the findings because they can grow them easily at home and can provide better care.

Continues on page 66

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"Controlled brownpatch."
Larry Bunn, Blue Hill Country Club
Canton, Mass.

"3 week control."
Chris Myers, Bloomfield Hills Country Club
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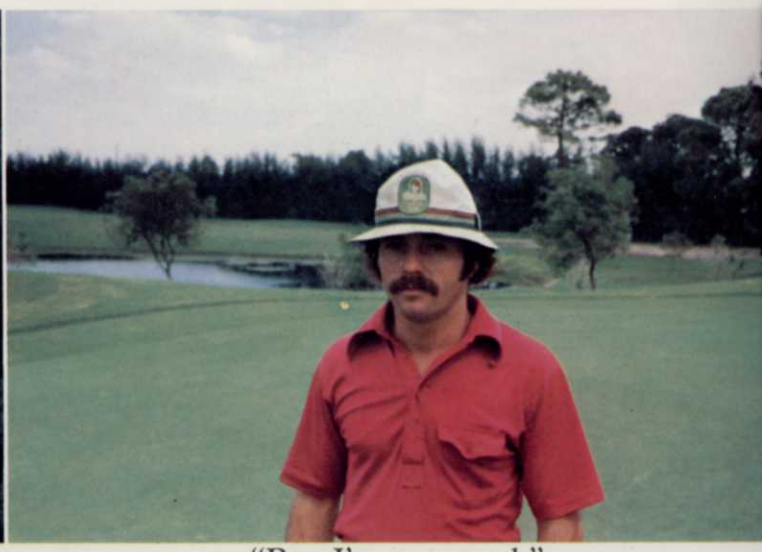

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The word is spreading fast and it's all good. "With Chipco 26019 we've pretty well licked our disease problems and it lasts up to 21 days!" said Larry Bunn at Blue Hill C.C.

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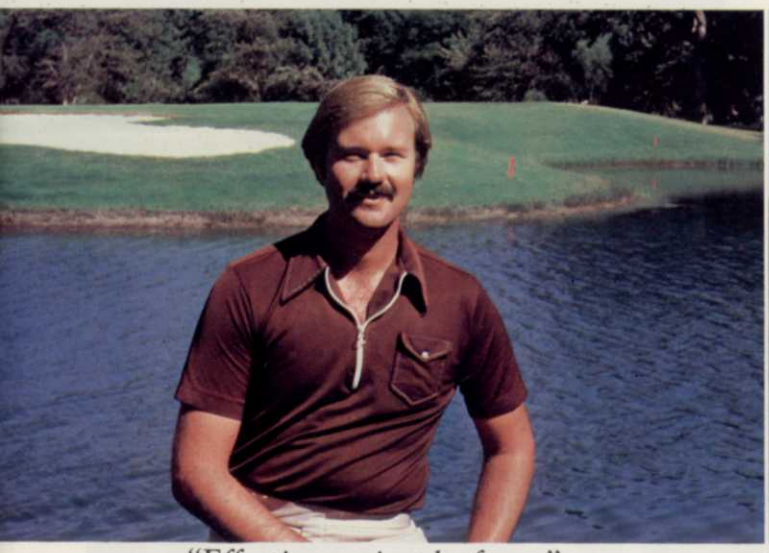

"Effective against leafspot."
Warren Stringer, Bent Tree Country Club
Dallas, Texas

"Eliminated dollarspot."
Robert Williams, Maidstone Club
East Hampton, N.Y.

ord from the guys that count.

Jim Bunn noted, "we controlled dollar spot and brown patch with two applications." And Chris Myers of Bloomfield Hills C.C. said that Chipco 26019 controlled dollar spot "longer than any other fungicide he used last year."

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DEFENDING THE GOLF COURSE: IT'S MORE THAN JUST A GAME

By Mike Hurdzan, Golf Course Designer, Kidwell & Hurdzan , Columbus, OH.

To most of the 92 percent of our population who are non-golfers, the golf course is a physical symbol of the affluent few who enjoy greater wealth and more leisure time. The golf course represents a playground for the rich and the idle even if it is a public golf course. This false but prevalent negative connotation explains why golf courses have become prime targets for controversy involving pesticide pollution, rising property taxes, and, in some cases, restricted water usage. Further the precedent of discriminating against golf courses has gathered momentum because the value of the golf course as an asset to other members of the community, both golfers and non-golfers, may not have been established. The stock rebuttal to golf course critics has been "that the golf course has improved property values near it" and "grass plants produce lots of oxygen". Neither of these reasons are very convincing to people who are committed to a pollution free environment, more tax dollars, or water conservation. But there indeed is a great number of reasons that can be given to support the existence of a golf course as a protector of the environment and an asset to all people. Then

Golf began on the links of Scotland where man put his skill up against natural hazards for recreation and enjoyment of being outdoors.

APPROACHING "PATRICK'S GREEN."

the point of this article is to examine the value of the golf course in the landscape and provide you, the golfer, with more thoughts with which to defend the golf course.

There are those environmental advocates who say nature can only be protected by the total exclusion of man; and for some special environments, I believe this is a valid approach. However, not to recognize man as part of the environmental equation, or to recognize man as only the exploiter of the environment, demonstrates an unrealistic perception of natural processes. Equally unrealistic are those deeply concerned and committed environmentalists who fail to recognize that all environments are dynamic and changing, and to preserve an environment does not mean freezing it in time and place. In fact, if we separate the term "Environment", meaning a sum expression of physical forces, from the term "nature", which means occurring inherently, then we find that nature herself is a poor "wife" to the environment. Nature is constantly exploiting the environment by permitting overproduction of natural species of both plant and animal life that is held in check only by slow starvation or extreme predation. And nature herself has universally altered the environment with catastrophic powers unequalled by man in the form of glaciers, floods, earthquakes, droughts and, on a smaller scale, lightning.

But since man can not control such natural traumas, we can and should only be concerned with intelligent use of natural resources which includes not only a sensible use rate, but also a sensible protection plan. The urge to protect only occurs when one senses that something has real or intrinsic value and deserves respect. For man to respect nature; he must meet her, sense her beauty, realize her complexities and then resolve to protect her.

Many people approach nature in numerous ways, and to different intensities of experience. For some it is the long trips into remote regions carrying a backpack or paddling a canoe. For others at a less intense level, a short weekend or day trip to a reserved area. For others it is the casual experience of a walk in the woods, a park or a flower garden. Each of these experiences can be effective in allowing man to learn to respect nature.

Golf falls into the latter category of casual experiences; but golf as a recreation, does attract man into nature. It attracts him into regions that he, by his personal nature, may not otherwise be exposed to. Examples of how golf has expose man to nature are many, one such area is remote seashores.

Remote Seashores—Golf started on the links of Scotland and the land was used exactly as it was found. The wind-protected depressions supported growth of fine bentgrasses that were kept mowed short and fertilized by the rabbits and these became the first greens. Fairways followed natural land forms which supported turf growth. Other areas remained hazards. Early town records show golfers may have selfishly been the first conservationists for they argued in town council to protect their course from those who wished to graze herds of sheep that would have completely changed the character of the dunes. Golf was played on natural links land for 500 years until about 1700 when the first inland course was built. The architecture of this first inland course and all that were to follow for the next 200 years were attempts at reproducing the natural links character. However, as the industrial revolution allowed more citizens to play golf, changes in architecture were required to accommodate increased play, but always the attempt was to keep nature.

Even today in seashore settings, man is attempting to protect nature as shown at Amelia Island, Florida.

Golf has moved man into the:

Deserts, where the shear contrast of man battling to keep a small amount of ground against the ever incessant encroachment of nature provides every visitor with a humbled sense of how strong natural forces are compared to man. It takes only minutes to realize that without constant care and effort, all desert developments would again become deserts. Most men are awed enough by this spectacle that they feel strongly in using the desert resources at sensible rates.

Swamps, which have always been areas feared by men because of the associated dangers of snakes, crocodiles, quicksand, insects, disease and black water. Few men were mentally able to relax enough to view the swamps not as hostile areas, but rather as concentrated pockets of natural processes. Today more people have been moved into swamps by the lure of golf than any other single mechanism. And further golf has moved man into

these areas in a relaxed frame of mind so that he feels safe on the course per se, but is constantly probing the edges to experience the swamp environment. To reinterate this casual experience will in no way teach golfers about swamp ecology, but it may move him to support efforts to preserve wetlands designated by experts. For my opening premise was that for man to respect nature; He must meet Her, sense Her beauty, realize Her complexities and then resolve to protect Her.

Mountainous regions, where golf is far removed from its birth-place along the sea, but nonetheless, golf is at home in the mountains and is in harmony with its surroundings. Mountain valleys converted for golf places an economic value on mountain land that causes responsible people to use it at a sensible rate and hopefully in a sensible way.

Golf has adapted itself well to wasteground or land currently unusable for other purposes.

But not all golf is confined to scenic or valuable land. Golf has adapted itself well to waste ground or land currently unusable for other purposes.

Floodplains have always been avoided for development not only because of the potential for total flood damage to crops and buildings, but also because of damage of erosion or silt deposition. Golf courses, if properly planned, can not only withstand the flood threat and reduce erosion but also they convert wasteground to a valuable recreational property or a community asset.

Landfills and their resulting ground water and visual pollution. Such areas, when converted to golf course use, not only reduce the visual objections but also cause money to be invested in ground water control. A converted landfill or strip-mine also provides more tax revenue for municipal works and schools.

Golf has made use of land otherwise restricted for another use such as landing approaches to airports and utility right of ways. Placement of golf courses in these areas not only improves the aesthetics of such land, but also removes a need for clearing cutting or the use of defoliant sprays.

Preservation of large tracts of historically significant land can be costly, and when the interested group of preservationists is small, there may not be enough money or political impact to save a site from a developer. Many times a golf course can be built on the historical site with little disruption to the special feature of the site and thus allow some site preservation. A classic example is the Mound Builders golf course in Neward, Ohio, built in and around the great Octogan Earthworks. Some purist may feel that the symbiotic use of this ground is more of a sacriledge than a salvation. But one need only look at the rest of the mound complex not occupied by the golf course and see that virtually all vestiges of the earthworks have lost to housing.

To summarize to this point it should be evident that golf does move man into nature and allows him to casually experience various habitats. However, the best part of it is that man pays to do it. Golf is unique in that it can produce thousands of dollars of annual revenue that can be used to produce or improve other natural or recreational areas. Many government agencies that operate golf courses use the profit from golf to provide free tennis courts, ball fields, trails, parking lots and other non-revenue producing recreational facilities. Further, golf doesn't obliterate nature like some forms of recreational developments, rather, it only causes a shift in the ecosystem that favors other types of organisms and populations.

Studies have shown golf courses to have improved populations of rabbits, fox, raccoons, skunks, opossums, deer, small birds, and numerous lower animals. In fact the Audubon Society produced a book many years ago called Golf Clubs as Bird Sanctuaries, that went into great detail about aviary populations on or near golf courses. By constructing ponds as hazards, water storage areas, and aesthetic installations, man has reduced erosion, improved plant growth conditions by better drainage, improved aquatic populations of everything from beavers to frogs and fish and to great blue herons and ducks, and has attracted man out into nature.

Many times the alteration to the ecosystem caused by a golf course development has other benefits as well:

1) Actively growing turfgrass acts as an air filter and can produce oxygen at the rate - 1 A/day = enough O_2 for 1742 people/day.

2) Tightly grown grass swards eliminate erosion.

3) Large grass areas have a cooling effect on surroundings.

4) Noise pollution is reduced.

5) Property value is improved.

6) Serves as a receptor of human wastes for many golf courses use sewage sludge fertilizers, compost, and unpotable water sources.

The American Society of Golf Course Architects in conjunction with the U.S.G.A. through its' research foundation has contracted the University of Florida to study the use of sewage effluent for golf course watering.

Golf courses have year round alternative uses other than golf. Constructed ponds in the summer may provide fishing, bird and waterfowl study areas, small boating, swimming or scuba diving. In the winter these ponds become skating or hockey rinks. The golf cart paths make excellent jogging or walking trails and bicycle paths in both winter and summer. The fairways and rough areas make good areas for crosscountry skiing or sledding with a minimum of snow cover. Perhaps the greatest alternative use for a golf course occurs on soft, warm, nights by couples - both young and old.

Speaking of young and old brings to mind the fact that golf is a game for all ages, all physical abilities and all income levels. In very few physical sports is

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there more social mixing of people in a fair competition. Although strength is important, timing and coordination are more so, for golf is a game of skill. By handicapping, a fair competition could be arranged between a young strong golfer and his grandmother. When public golf is offered at prices comparable to movie house admissions, and used equipment can be bought for the price of baseball gloves or a bowling ball; golf is within reach of all income levels.

At this point I trust that I have clearly established the value of a golf course as an asset to the community for all people. I have eluded to the fact that golf courses, in some instances, are outright protectors of the environment, but there are those who would respond that the very act of building and maintaining a golf course is destructive. This point of view is not totally supported by those who have carefully observed and monitored such activities. Let us look at some of the more often heard comments about each construction step.

Clearing - There has been heard on occasion the comment "that the golf course will totally destroy the woodland". Admittedly, during the actual clearing operation it seems as if the entire woods is being ruined since about 50 percent of all trees must come down. However, it must be remembered that the goal of good golf course design is a natural appearance and most golf course designers are environmentally aware. As a result those trees that must be removed are carefully selected and marked so that the best trees remain. Many, many golf holes have been altered to save a specimen tree or stand of trees.

When public golf prices are comparable to movie tickets and used equipment can be bought for the price of a bowling ball, then golf will be within reach of all income levels.

The areas outside of the fairways are selectively thinned to allow sufficient light and air movement to permit good grass growth. This thinning operation in combination with the fertilization given in these shaded areas results in a stronger, more vigorous tree. This tree is growing in an environment of better nutrient, light and water balance with a reduced possibility of disease or insect infestation. Golf fairways wandering through a wooded area have also been praised by foresters as irrigated firebreaks.

During the **earth moving phases** of golf course construction, references have been made toward "wholesale erosion" of topsoil. But this is not likely for all topsoil is stripped and stored in areas of grade change and replaced to encourage good turf growth. Since erosion can cost the contractor thousands of dollars in repair and replacement every means of prevention is used. These include confining earthmoving on erosive slopes to a minimum, seeding to a cover crop as soon as practical and straw mulching all disturbed areas. Although some soil may erode and temporarily pollute some streams, the loss is small when one averages it over the life of the golf course.

Although in most parts of the country golf courses are constructed by cutting and filling of land above the ground water table sometimes the construction of a golf course alters wetlands by draining or filling. However, such alterations may not be without benefit. The usual procedure in golf course construction is to dig a lake and use the fill from this operation to raise the surrounding land. This area of filled land usually does not extend more than 100 yds. wide. This narrow distance does not significantly alter animal corridors and actually benefits most species. Development of a deep lake instead of shallow swamp permits a wide variation in aquatic life ranging from more diving ducks to species of fish. Surrounding land is better drained and water storage for fire protection or animal preservation against drought is improved. Again, any designer worth his salt would seek to harmonize the golf course into the wetland environment by leaving many large untouched areas and not try to change the character of the wetland.

Stream channelization can dramatically and adversely affect a delicate environment. However, if no such unique or delicate habitats exists, stream channelization when properly done has many beneficial effects.

1) Straightening out a meandering stream may allow better use efficiency with minimum construction, best land utilization, and least development costs.

2) Allows more efficient stream bank maintenance and better access.

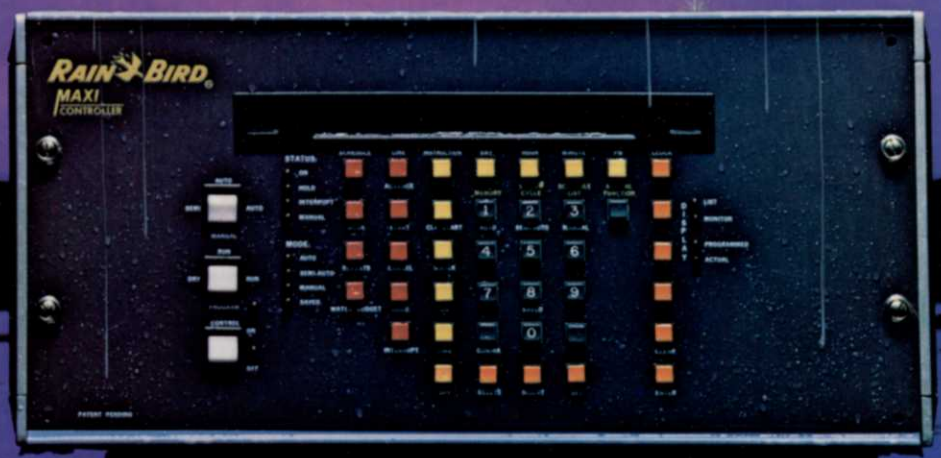
3) Increased flow may increase oxygen content of water thus combating purification.

I feel certain that there are other objections to golf course construction but in all instances I know of, the benefits of properly building the course outweigh the detrimental effects.

Objections to **golf courses' maintenance practices** usually center on the use of fertilizers and pesticides. Most of the early discussion was based on intuitive calculations about pollution and contamination resulting from surface and subsurface runoff. When such allegations were first made, there was no basis in fact to counter them, simply because no one thought of it before and no one really cared. However, in the last five years, extensive research has shown no significant runoff of chemicals of any kind if properly applied. This phrase "properly applied" is not a cop-out for only a very small fraction of a percentage is not properly applied. The golf course superintendent of today is usually college trained in a program that is geared to pesticide safety. He is, in most cases, licensed as a commercial applicator, and to

Continues on page 80

THE SHAPE OF RAIN TO COME.



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INTERIOR PLANTSCAPE CONTRACTORS SEEK RECOGNITION IN LIGHT OF GROWTH

By Bruce F. Shank, Editor

Now an $80 million market, interior plantscaping needs special consideration from architects, researchers, and growers

The interior plant design, installation and maintenance business is possibly the greatest beneficiary of changing standards within the professional landscape horticulture industry in the last decade. Furthermore, it is likely to be one of the fastest growing Green Industry businesses in the 1980's.

So it is no surprise that interior plantscape firms want to be recognized as a unique and important part of our professional plant care world.

Currently estimated at $80 million in installation and maintenance, the interior plantscape business has three major needs; to educate the landscape architect about the differences between interior and exterior plant materials, to develop technical support from extension and foundation research, and to find trained and self-disciplined maintenance people. These three needs are the reasons why interior plantscape businessmen want a specific identity that will make an impact on landscape architects, tropical plant growers, and educational institutions.

Three associations currently serve this type of business; the Associated Landscape Contractors of America (ALCA), the Interior Plantscape Association (IPA), and the Society of American Florists (SAF). Many interior plantscape firms belong to all three. Most of the original organizational work was in SAF and through an annual tropical plant workshop held each January at the Agricultural Research Center in Apopka, FL. ALCA and IPA appear to be making a greater effort to serve the interior plantscape businessman than SAF at the moment. Both are in the process of establishing standards and technical guidance to counteract any bad reputation caused by fly-by-night operators taking advantage of a healthy market.

One major weakness in the interior plantscape industry could be that many people in the business have backgrounds totally unrelated to horticulture. They have learned by trial and error and may lack some of the knowledge important when problems arise. It also gives the market that 'anyone else can do it' appearance, which is no longer the case. When you consider the risk of guaranteeing large interior plantscapes, a small, undercapitalized business could get wiped out by one technical flaw in a maintenance program.

The interior plantscape business has become sophisticated big business. In many cities landscape architects recognize the expertise of the interior plantscape firm and consequently consult or subcontract interior tropical plant design to them.

The business has already withstood one invasion by good intentioned but unskilled 'flower children' in the 70's. It has grown out of the tropical plant store, the florist shop, and the nursery into a service business, often outgrossing the business that originally launched it. Any idea of interior plantscaping being a passing fad can be refuted by the healthy and continued success of firms started in the early 60's.

Jerry Leider and his Tropical Plant Rentals in Chicago are cases in point. Leider, who started his business in 1963, now runs the biggest interior plantscape operation in the U.S. He talks about the first 17 years;

Tall ficus trees tower over diners
in the Colony Square Hotel, Atlanta, GA
(Photo courtesy IPA).

"We started in the midst of a building boom in the early 60's. Lady Bird Johnson traveled the country urging protection and beautification of our environment. Architects began designing buildings with atriums and lobbies for tropical plants. Hyatt Regency Hotels are one example of interior landscaping that received tremendous exposure and publicity. In the early 70's, the small tropical plant store grew by leaps and bounds posing a temporary problem as they attempted maintenance work. By the mid-70's this business leveled off and we settled down to concentrate on improving the technology of interior plantscaping ."

Don Mastick, president of Foliage Plant Systems in Clifton , N.J., traces interior plantscaping back to 1869 and a German immigrant named Brers who started an exotic plant nursery in New Jersey. Key factors in the growth and sophistication of the market were, according to Mastick, educating the landscape architect that specifications for outdoor plant material did not match those needed for interior material; the development of commercial species specifically for interior plantscaping, and more sophisticated accounting practices by the interior plantscaper to insure himself against losses to guaranteed plants.

Mastick has used computers to keep track of costs for more than three years. He uses the computer to control loss rates, plant lists and costs from growers, and perform inventory.

"The attractiveness of the business is that it is not capital intensive," Mastick said. "However, when

Interior *from page 25*

the new company grows to the point that a second and third person are hired and can't be supervised all the time, and one of these individuals is taking care of $20,000 worth of plants and for one reason or another loses a fourth of them, then the small business does not have the cash to handle the guarantee. It's the management of people that is so difficult. The technician has to be out there on an honor basis because the small firm can't afford the overhead of job foremen."

Harry Belin, president of Indoor Gardens in Alexandria, VA, and president of IPA, has been involved with interior plantscaping for about five years. In this time, he has noticed too many architects and designers associate the interiors with the exteriors. He has spent many hours trying to have specifications altered to practical levels. "We have seen bid specifications for interior work containing magnolia grandiflora, azaleas, gardenias and jasmine," said Belin. There was too much confusion, and not enough of a specific identity to make an impact to let people know there were some major differences between interior and exterior plantscapes."

Until recently, it was the grower and production specialists who gave the most advise to interior plantscapers. The short course in Apopka, FL, each January still remains the essential course for the field. The three-way relationship between grower, extension, and plantscape firm helped achieve changes such as acclimatization by shading, artificial soils, and larger material. But the grower's interest is still using his greenhouses as efficiently as possible and the extension service in Florida is there to serve primarily the grower. Research from the position of the interior plantscape firm is needed. Some is underway, at universities such as Ohio State, California Polytechnic Institute, Rutgers, and North Carolina State. Support for this research could speed up such possible improvements as low light tolerant hybrids, more labelled insecticides for interior use, and precise nutrient needs under indoor conditions. Efficient lighting in the needed red and blue wavelengths for plants needs to be pushed on a display rather than a greenhouse level. Temperature and humidity reactions by specific plants need to be studied more precisely. Hardiness in general needs to be estimated for each commonly used tropical or semitropical plant.

Meantime, ALCA and IPA are working on maintenance and design standards. IPA is considering a certification program, based on a manual it is now developing. ALCA is holding regional and national sessions on interior plantscaping and IPA is planning a major meeting in September in Dallas and full support of the Apopka program this coming January. State florist associations are strengthening their programs in the area of interior plantscaping.

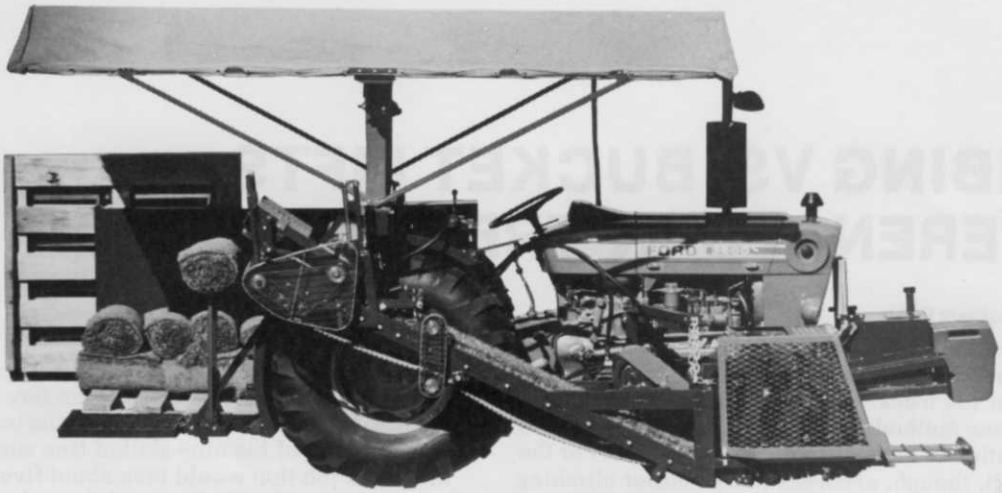
If industry data were tabulated, universities and technical schools might offer programs to train technicians. Specific informational needs should be spelled out by the associations, developed by qualified individuals, and made available. All this is very likely in the next three years.

So far it appears that energy considerations have had no effect on the market. Reduced energy for heat and lighting only further strengthens the need for research. Offering affordable conversions to older buildings not originally designed for plants will perhaps create a renovation specialty within the field. The demand for residential plantscapes may be the niche for small or new firms.

Even though the market grew out of the floral business, it resembles in many ways the services offered by the landscape contractor (exterior); installation, maintenance, and sometimes design. However, the plant material is more aligned to the floral industry. Being in the middle, members of this field should participate in both. The management aspects of landscape contracting are important to know and the special care knowledge of the florist is equally valuable. Neglect either side and you may get in trouble.

So far, interior plantscape professionals seem to realize this and hold memberships in both ALCA and SAF. Whether IPA can consolidate both specialties into one organization is yet to be seen, but certainly its efforts are worthy of support. Perhaps membership in all three is the best answer for now. **WTT**

Plants create relaxed atmosphere at a cocktail area in the Colony Square Hotel. (Photo courtesy IPA)



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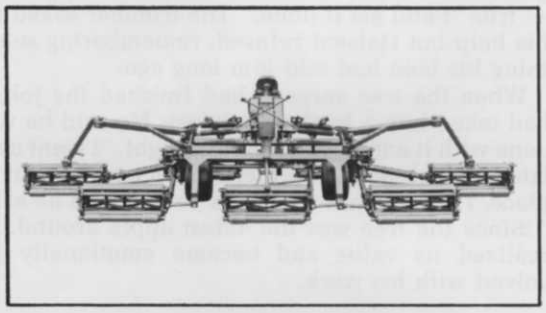

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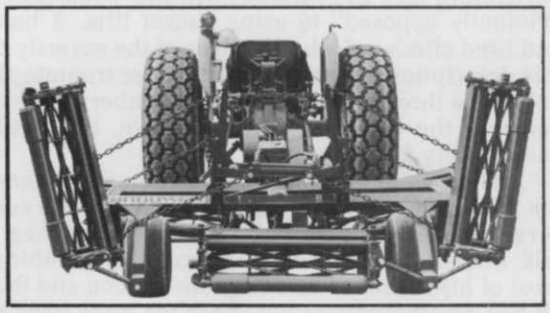

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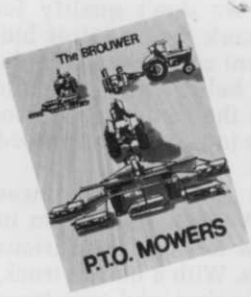

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CLIMBING VS. BUCKET LIFTS: PREFERENCES IN TREE TRIMMING

By John Kerr, Assistant Editor

There are two ways to trim a tree—climb it or use an aerial lift truck. Certain circumstances clearly call for one method over the other and sometimes a combination of both ways does the best job. For the most part, though, arborists prefer either climbing or lifts and resist compromise.

David Halsted, founder of the Oregon Arboriculture Co., in Portland, OR, has been called "violently opposed" to using bucket lifts. A born and bred climber, Halsted laughs at the severity of this description, but truly thinks proper trimming is only done through the eyes of the climber. After 18 years in the business, 12 on his own, his words cannot fully say why.

"I know there is a good explanation and I know the results of my work compared to other tree surgery companies," says Halsted. After preparing a talk for six months on his reasons for climbing, most of his audience said they understood and that he had no other choice but climb the huge trees of the Pacific Northwest. There are Douglas firs 20 feet through and 300 feet high and Sitka spruce that extend 40 feet around and oaks that carry 300-foot spreads but all these do not prove his reasoning.

"Tree surgery is a type of pruning that you have to be extremely sensitive to what you're doing," Halsted says. "The only way you can do that is from working within the tree. You can't be isolated from it, and even if you're sticking up through it and try to design the tree the way you want it, it's like cutting blackberries or brush from a distance."

"I could find more character, more design, and more creativity from working within the tree," he says. And the fact exists that some of the trees are just too tall for a lift, or if in a back yard, too inaccessible. "You add all these things together and the love for my work and that's all I can do to total it."

"I find more character, more design, and creativity from working within the tree." Halsted

"I've seen my boys go into work in the morning and they'll knock off at noon because they just don't feel right or can't get into it. They'll stop because they're not performing the way they should be. I think our quality is better than anyone in a lift bucket unless he has the same moral attitude, and if he did that he'd be doing it by hand because it would be too expensive to use a bucket. If he was taking the time to do the tree the way he should it would take longer or as long as a bucket."

One day Halsted had the job of taking care of a pioneer apple tree that the Hudson Bay Co. planted in 1826. Because of its immense historical value, he sent the best of his nine skilled tree surgeons to do the job, a job that would take about five hours. The surgeon came back after a while and told Halsted he was having trouble with the tree and couldn't get it to come out. "I told him it's just an apple tree — trim it and get it done." The trimmer asked for his help but Halsted refused, remembering something his boss had told him long ago.

When the tree surgeon had finished the job, it had taken him a total of 14 hours. He said he was done with it and hoped it was all right. "I went over later to look at it and there wasn't a leaf out of place. I asked him why it took so long and he said " 'Since the tree was the oldest apple around, he realized its value and became emotionally involved with his work.

"A man should know how to climb and the basics of pruning before operating a lift." Hawthorne

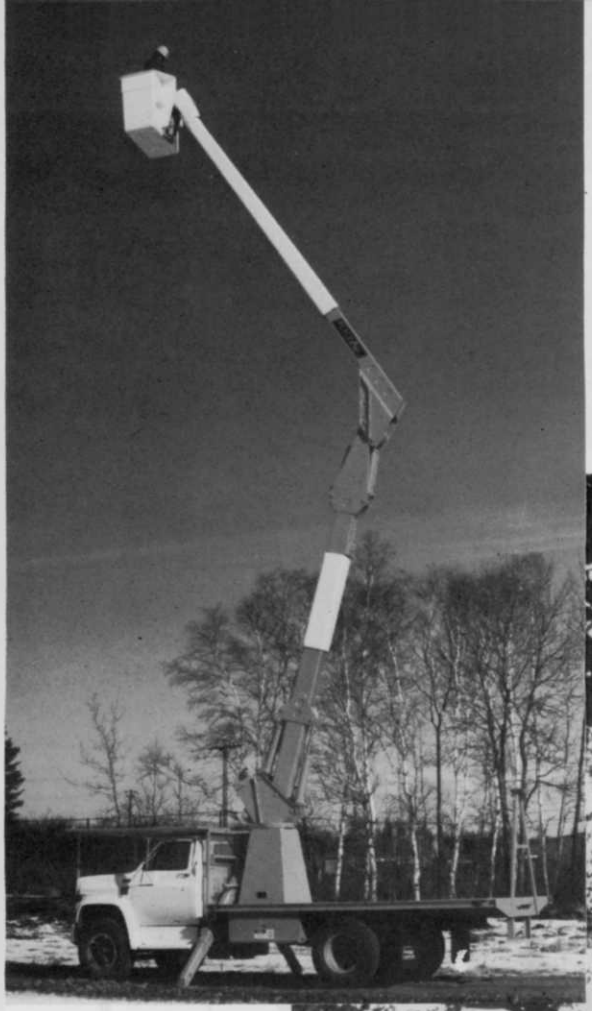
"These are the kind of people I have and this is the type of thing we do. It's what makes us number one. We haven't reached the peak yet and still have a ways to go," says Halsted.

Some of his customers include major architectural firms in the Northwest, eight or nine out of the 14 spraying companies in the Portland area and public and private owners of several national and state champion trees. He charges $35 an hour and is loaded with work.

Without trying to sound arrogant but with a tone that is set through experience, Halsted says, "Our customers qualify for us; we don't qualify for them." He doesn't do any work that requires bidding, except some government contracts which demand it, because he doesn't believe money should be the main determinant in the contract. He does little advertising. Most of his jobs come from word of mouth and his reputation.

Halsted won't argue that some circumstances justify using a bucket lift. A vicious ice storm in January 1979 forced his crew to work at a furious pace for the next five months. With a bucket truck, the men were able to pull broken and torn trees away from the Portland Art Museum to reopen it to the public. The crew worked seven days a week but was split in two so they still had two days off.

In one-on-one competition, Halsted thinks a man in a bucket truck could do an equivalent job to a



climber, if both had the same amount of time and money was no factor. "But time after time after time that man in the bucket is going to get careless because he's not part of what he's doing," Halsted says. "He can not be sensitive to that tree because he's not touching it, not feeling it."

The city forester in Portland once complimented Halsted on doing the best with what he had to work with on each tree. Halsted thinks some operations will usually do a good job, but not always consistently. "Ours is the same all the time. When our guy goes out, he doesn't know how many hours he has to spend on the job and he doesn't know how much the price is. He goes out and does that tree. When he gets done, he puts the time down and turns it in. That means he can do the same identical job each time. The only deviation from that is his own personal hangups which don't deter too much from the work."

Halsted says, "You start putting up a bucket through a tree and you can be careful and delicate but one of the things the truck is for is speed. You start pushing yourself and get careless and can break a branch. Instead of getting out of a bucket and into a tree on a branch you can't reach, you say 'the hell with it' and cut it off from there."

"Another thing I don't care for with the bucket trucks is that you're working from the outside in. Pruning should be done from the inside out. Your cuts should be made toward the tree because the branch grows out and when you make a flush cut, you make a flush cut toward the tree."

Working from within the tree is also important, Halsted thinks, because a tree surgeon can see how much light to let through the tree. "Our work is a lot of structure and growth control," he says. "There are little things like trimming to the north. You make your cuts so a branch turns to the north and down because everything around here grows up and toward the south."

Halsted's crew has used a lift truck on some trees, such as large elms, for 60 days and has done its usual expert job. But at the end of that time, Halsted thinks, a trimmer will start to become careless. Also, a man can easily go from climbing to a lift, but not vice versa. "You ask a man to come

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Climbing *from page 29*

down from his "throne" and ask him to hike up a mile and do some trimming and they just hurt and have a miserable day," says Halsted. "They're not used to it after riding around in a bucket all day."

Before Halsted began his own business, he worked with two other men in Eugene, OR, trimming trees for the city. They not only cleaned out the trees and made them structurally safe, but also raised them up for the streets, stop signs, and signal lights. When two of them quit, the city hired two others who were not as fast so it bought a bucket lift to speed up work. They did more trees, "but weren't trimming," Halsted says. "What they did was stop trimming and start line cleaning. The guys say now they don't have time to trim; they only have time to raise trees for the streets. We used to go through them and do them so they lasted five years."

Ultimately, however you trim, the bottom line depends on results. Halsted compares the appearance he brings out of a tree to what a barber can do to a head of hair, only in a sequence of years instead of weeks. The first impression is that you may have thinned too much, but then you realize you have enhanced. "They look handsome; you draw out the shape and a little limb structure," he says. The second year they look very nice, the third year excellent, and by the fourth year they start to get thick and may need a new trim.

"I fought going into business for myself in the beginning. I knew that it would take me away from my work and I didn't want to be away from it. I was forced to because the people didn't have anybody." Halsted has since turned the business into a shared ownership corporation, making a man a director after two years of service. "I used to have 100 percent of the company and I gave 300 percent away and now I have 500 percent," he says.

No matter how large the corporation grows and how much work comes with it, Halsted will not be using many bucket lifts. "There have been many times in the last 10 years that I wanted to buy aerial equipment because I could make money off it," he says. "I saw what it had done to other people and I fought myself against it. It's like something you don't believe in. You know it's not right or but you believe in it and become stronger. After that point goes by, you can rationalize and come up with some theories."

John Hawthorne, owner of Hawthorne Bros. Tree Service, has worked without a bucket lift, but since he purchased one in 1972, he's been using it constantly. His private tree care firm in Westchester County, NY, operates its 52-foot Hi-Ranger 100 percent of the time. "It's helped us tremendously," says Hawthorne. "It's worth its weight in gold."

Hawthorne would not disagree with Halsted that it takes a qualified person to take care of trees. He

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just feels there's no reason you can't use a bucket truck. "A man should know how to climb and at least the basics of pruning before operating a lift," says Hawthorne. "We don't send anybody up in trees who doesn't know how to work by hand first. I think that's basic to doing a good pruning job." Only in utility work, where the company is not concerned about structure, could a man get away without full expertise.

"I'd say about 75 percent of our jobs can be done with a bucket truck." Back yards do pose some limitations, says Hawthorne, but he has moved shrubbery, fences, and stone walls to get to a job that involves a dangerous takedown.

In a case where an 80-foot oak tree had died three years ago and now hangs over a house with new residents who want it moved, it's too risky to send a climber amidst dangling branches and a cracked trunk. Hawthorne also wouldn't send a man up in a tree that's been hit by lightning. "It's possible that a man in a bucket truck could be hit, but he's got more control over where he is. He's not tied to the tree. He can get away. The chances aren't as good that the bucket truck will fall down as much as the tree."

In storm damage, it's the same case. Where there are broken or hanging limbs that have to be moved, it is easier to lift them off from a bucket truck. "A climber takes the chance of something falling on him," says Hawthorne.

At one time, it took three men, two ladders, and hedge trimmers three or four days to trim a 20-foot hemlock hedge. With a bucket truck, one man can do the job in one day.

"When you have disease in a tree, such as cytospora canker on spruce trees, it's much easier to prune out when you're away from the tree because you can spot the diseased limbs and snip them away from the bucket truck," Hawthorne says. "It takes two men without a bucket truck. One has to be in the tree and one outside to spot where the disease is. The color on branches changes very subtly sometimes and a man outside can spot trees much easier. It's also easier to trim a Colorado blue spruce from the outside because it's so tight on the inside."

In most tightly branched trees, where a bucket couldn't maneuver well, Hawthorne would use climbers. "It's hard for a bucket truck to do maples, but any widely-spaced branching tree is easier to do on a bucket truck," he says. This includes red and white oaks, sycamores, and many others. "Either you put two climbers in a tree to prune it or you can use one man in a bucket truck to prune it by himself. It's much easier than having to go all the way down the trunk, out a limb, or swing across."

Hawthorne's crew also finds a bucket lift helpful for pollarding, shaping, and topping trees. The bucket maneuvers around the end of limbs for convenient access to the perimeter of the tree and gets to the top of a tree, which could never support a climber. Moving around the perimeter also helps combat a disease like twig gall on oak, which strikes the tips of branches. "A bucket operator can be in any position a climber can be in and he can

Continues on page 80

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LIFT TRUCK SELECTION IS BASED UPON EFFICIENT USE

Lift trucks are not the total solution for every maintenace operation high above ground level, but they can bring a man close to the job in quick time. The arborists in the article in this issue about climbing or using aerial lifts speak about many of their advantages and disadvantages. Each person must decide whether the job and cost can justify their purchase. What follows should help you learn their uses and what, if you decide it is the right equipment, you have to choose from.

The straight-line bucket travel of the Hustler II and Linesman II series from Mobile Aerial Towers, Inc. enables fast, easy work along walls, wires, or poles. Outriggers or torsion bar provide a firm base for the continuous rotation shearball turntable pedestal, while beefed-up hydraulic elements, linkages, and bearing and pin components assure dependable strength and safety.

Series 4F Hi-Ranger from Mobile Aerial Towers, Inc.

One-hand control permits the operator to precisely move the tower and do more efficient work. Its uncluttered design helps for safety and low maintenance. Upper and lower boom insulation and the insulating bucket effectively protect personnel against electrical hazards. Hustler II Series 4F reaches heights of 45 feet and the Linesman II Series 5F reaches heights of 57 feet. Utility models reach as high as 130 feet. (Circle **200** on free information card).

The 1000 Series Sky-Worker from Correct Manufacturing Corp. are lightweight, maneuverable, and efficient elevating and rotating work platforms. It is possible to start trimming on the ground at one end of the truck and continue working in an arc until you arrive on the ground at the other end of the truck, without revolving the turret. The operator, in the bucket or work platform, has complete control at all times and is able to place himself anywhere he wishes as long as his boom length is sufficient.

An open center hydraulic system powers the trucks. Work platforms are normally 24 inches square inside and 38 inches deep (deeper are available). Capacity is 300 pounds. The company's Alpine models extend to work heights of 70 feet and stow compactly for over-the-road travel. (Circle **201** on free information card).

Calavar Corp.'s line of self-propelled aerial work platforms, called the Condor, comes in heights of 38, 46, 48, 56, and 66 feet. Its enclosed box-type frame construction (welded and gusseted on both sides) provides the rigid foundation which ensures strength, durability, and stability. Turrets are made of heavy plate steel, providing strength and rigidity.

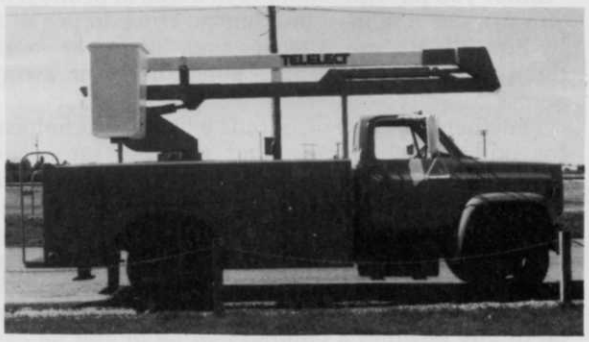
Boom sections consist of all-steel telescoping members which slide on low-friction, high-density polyethylene wear pads. Dry boom construction eliminates the need for grease on the boom, reducing wear and maintenance problems. Platform capacity is 500 to 1,750 pounds. (Circle **202** on free information card).

The Hotstik LC from Pitman Div., A.B. Chance Co., is an aerial device that one person can operate with speed, safety, and sureness. It mounts on a small truck and squeezes into alleyways, scoots under shopping center service tunnels, and reaches out across ditches or roadways to handle aerial maintenance calls.

Some of its features include: continuous rotation turret, five electrical slip rings, Expoxiglas upper boom and lower boom insert, hydraulic pump kit, 42-inch deep fiberglass bucket, and remote stop/start system. It comes in 36 or 40 foot ranges and other similar models range from 32 to 41 feet. (Circle **203** on free information card).

The Telelect TN Series aerial devices are made for safety. Features include 16 feet of fiberglass dielectric protection in the upper boom, well-planned controls and overrides, and other pro-

Sky-Worker by Correct Mfg. Co.



TN-Series Lift from Telelect Inc.

tective features. Three models—the TN50, TN55, and TN60—have working heights of 55, 60, and 70 feet respectively. Overall length is 28 feet, 5 inches, 30 feet, 8 inches, and 36 feet, 8 inches, respectively.

The boom design offers solid strength and rigidity without adding excess weight. The fiberglass section of the upper boom is made by a precise filament winding process that results in superior interweaving and interlocking of the glass fibers and resin matrix. Material handling capacities are 1,000 pounds plus two men in baskets, depending on platform configuration and boom position. The MC Series, also from Telelect, has a working height of 41 feet. (Circle **204** on free information card).

Reach-All Manufacturing & Engineering Co. makes aerial baskets with working heights from 34 to 150 feet and reaches to 50 feet. Other features include automatic hydraulic basket leveling, full pressure hydraulic controls, double cylinder articulation, and a highly-sensitive, precision-operated single stick control. Models are also available with high voltage dielectric certification up through 765 kvac.

Model 5032 holds 300-pound capacity in its end-mounted basket, which has a three-sided working area. The basket is made with 8-foot clear span fiberglass insulation and has automatic hydraulic leveling. Full pressure hydraulic controls are at the base and basket. The boom moves flexibly with 360 degree continuous rotation. The torsion bar stabilizer is the only counterweight required. Manufacturer makes many other models. (Circle **205** on free information card).

Continues on page 36

Model 5032 by Reach-All.

Tree climbing tools increase safety margin

The safety record of arborists is proof of their professionalism. There is no place for carelessness in the business of tree trimming. Before taking the first step off the ground, the climber should thoroughly check to see that his equipment is complete and functioning properly, similar to a parachutist checking his gear before jumping.

Skimping on equipment is really skimping on safety. Some of the improvements in climbing gear include comfort, ease of use, and additional protection. Nothing is more disturbing to a climber than trouble with his equipment while in the tree. When a job takes two or more hours, a saddle can be unsafe just from a pain factor and lack of concentration on the job at hand. Safety equipment should be kept up to date to provide all the benefits of modern improvements.

For more specific information on safety standards of equipment and procedures, each climber should have a copy of the American National Standards Institute publication ANSI Z133.1-1979, developed with the assistance of the National Arborist Association. To obtain a copy write NAA, 3537 Stratford Rd., Wantagh, NY 11793, or ANSI, 1430 Broadway, New York, NY 10018.

If you don't meet the standards in this publication, then your climbing program is not as safe as it should be. A little precaution is cheaper in the long run than an injured employee or a careless public image. **WTT**

Lifts *from page 35*

Time Manufacturing Co also constructs aerial bucket lifts and the model SHV-32/36 comes in heights of 32 and 36 feet to the bottom of the bucket. Models are either insulated or all steel. The bucket holds 350 pounds and is positive leveled. The lift has full hydraulic controls as well as hydraulic tool power in the bucket. A PTO driven pump or engine generator provides the hydraulic power.

Engine start-stop from the bucket is standard and is complimented by an automatic throttle control system. Accessories commonly used on both insulated and steel aerial devices of this height are offered. (Circle **206** on free information card).

The JLG Industries, Inc. Lift model 80F is a sturdy, safe, dependable way to put workers and their tools directly to above-ground work areas up to 86 feet. With the use of "X" type outriggers for stability and proportional controls for smooth boom operations, the 80F lets the user maneuver over or under obstructions without disturbing production lines.

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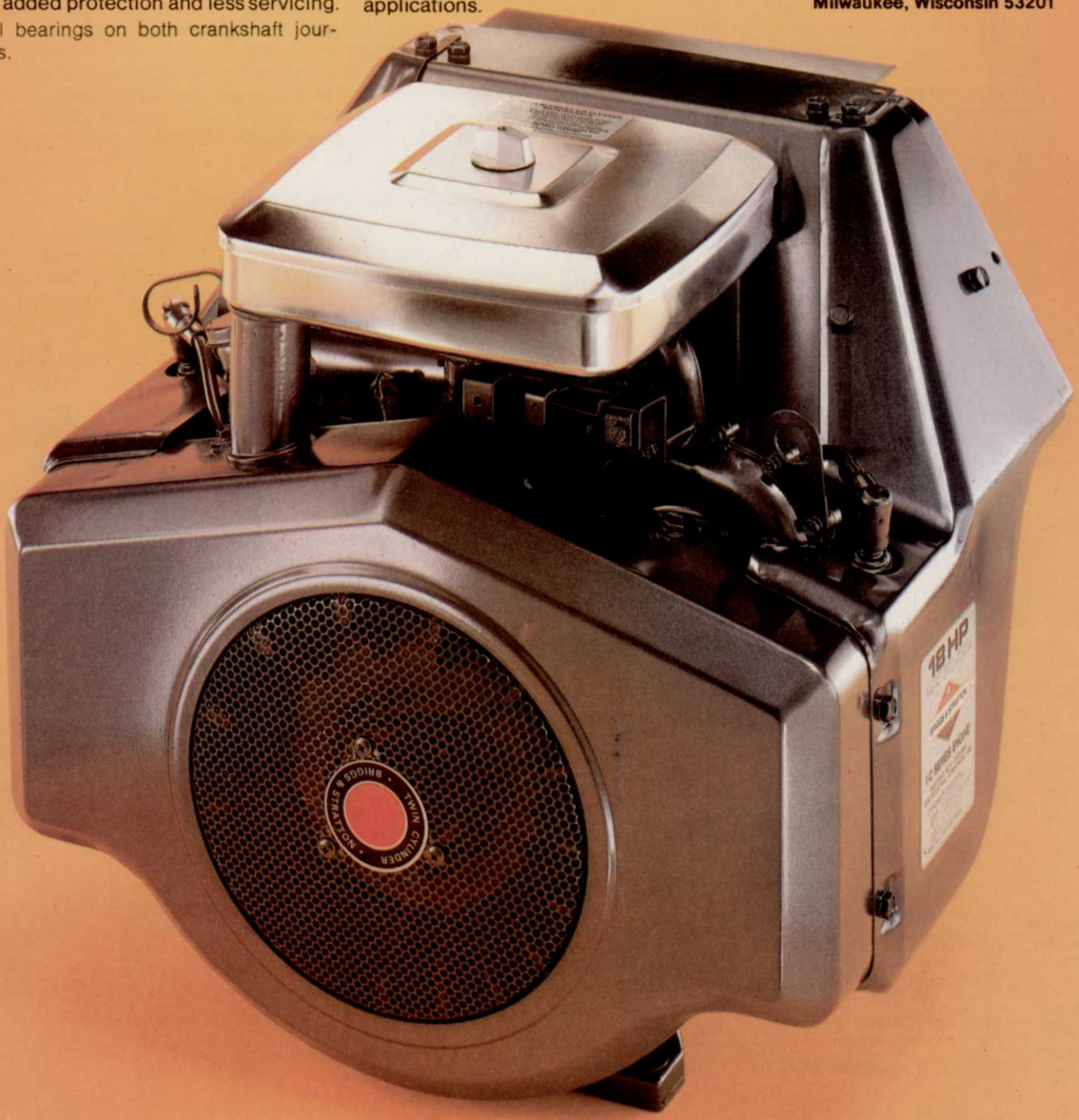

NO FRILLS FUTURE MAY REQUIRE CLOSER ATTENTION TO TURF SELECTION

By Robert W. Schery, Director, The Lawn Institute

Maybe it's just as well we don't see the future clearly. We just might dash for cover and try nothing! Although the crystal ball be clouded, past happenings do shape the future and we can draw inferences from them. An era of affluence in America is almost certainly tapering off, and this will appreciably influence those minding turf.

Except, perhaps, for a few luxurious sportsfields supported by huge spectator crowds (and often TV revenues), we can expect stringencies. Since budgets seldom keep pace with costs and taxpayer recalcitrance to government spending is commonplace, the broad sweep of park and recreational grass management will need to increasingly concentrate on essentials. Necessary measures will need clarification; frills may have to go. Know-how and professionalism no doubt will be rewarded, but I foresee impatience with wastefulness in a world that has its fill of shortages and disruptions.

To deal precisely with "essentialness," one must be cognizant of today's dramatis personae of the turf. Only by knowing the grass is it possible to plan its care intelligently, and to decide the degree of flexibility warranted under prevailing local conditions. Surely mowing, weeding , and in many climates, watering, cannot be denied, although increased efficiency in their practices may be called for. Ceasing fertilization would sacrifice a most effective maintenance technique, but plantings of lesser importance can hardly be expected to receive the generous feeding advised by turfgrass authorities.

Yet turf can be kept quite attractive as well as useful under minimal maintenance. There has been a tendency, I think, towards over-solicitousness, and overly complicated programs in the tending of turf. Under a scenario likely for the future, intensive care may be ruled out due to the law of diminishing returns for all except specialty plantings.

Turfgrasses, the modern image

Of course any grass must be adapted to the climate where used. The map of the United States shows major regions dictated by warmth and rain-

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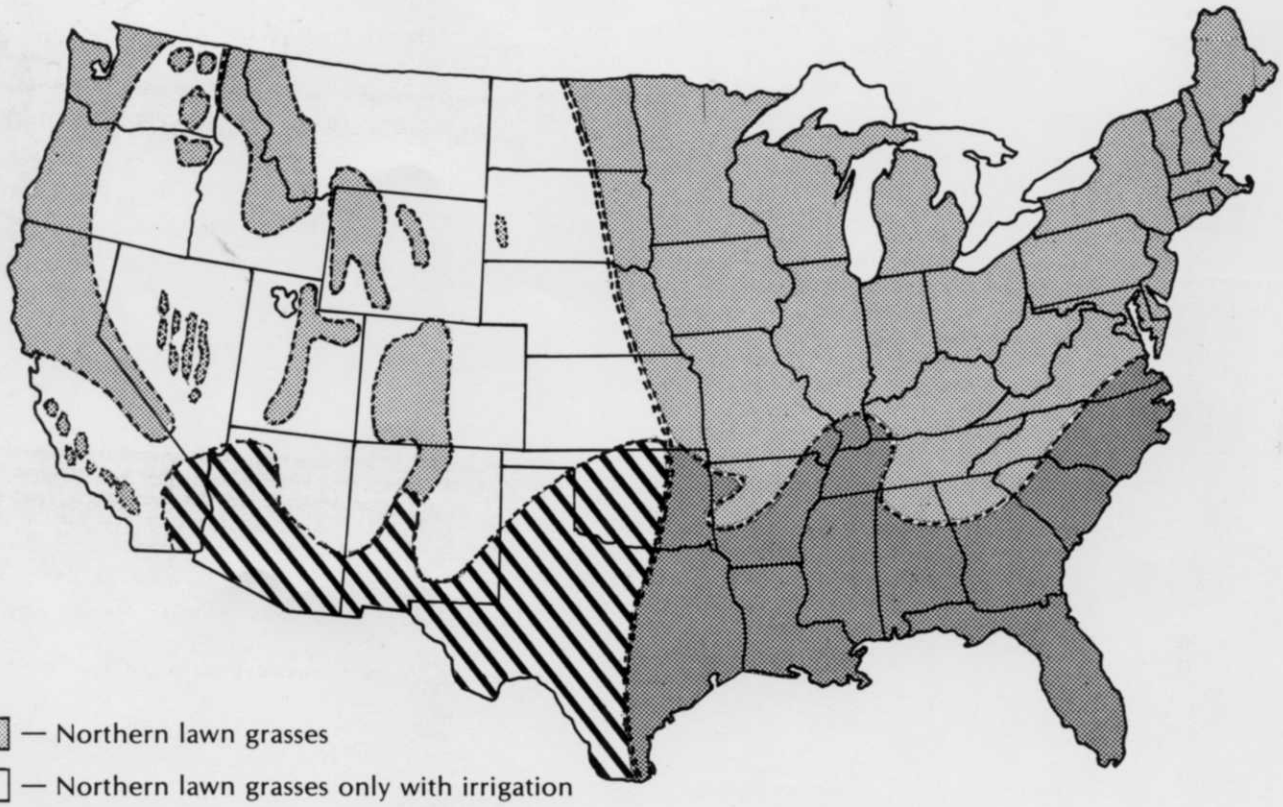

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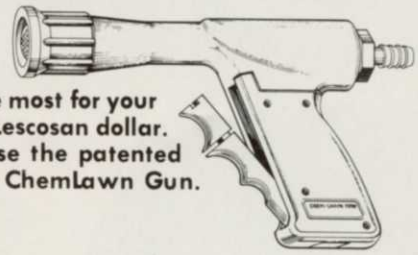

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fall. For the southland, the bermudagrasses *(Cynodon)*, St. Augustine *(Stenotaphrum)*, and bahia *(Paspalum)* are used in the deeper Southeast. These warm weather species spread mostly by trailing stolons. Because of their aggressive spreading nature, they tend to form solid patches, and are seldom planted as mixed populations. Thus, most southern lawns are meant to be a monoculture. Select varieties seldom come true from seed, so improved strains are used for the most part, planted vegetatively from sod, plugs, or sprigs. Indeed, only common bermudagrass, bahia-

Cultivars of Northern Lawngrass Species approved by the Lawn Institute's Variety Review Board.

Kentucky Bluegrass, *Poa pratensis* - makes good sod from spreading rhizomes, easily maintained, but somewhat slow to establish.

Adelphi - Rutgers hybrid, on most recommended lists; good quality, habit, and winter color; resists diseases and iron chlorosis; endures low maintenance.

Arboretum - Ecotype from stressful Missouri habitat, with good stick-to-itiveness under minimum care; natural type best mowed fairly tall.

Baron - Low-growing selection from Holland with allround good traits and wide adaptibility; a leading sod cultivar; blends suggested for lengthier persistence.

Birka - Top rating selection from Sweden; persistent, tolerant of low maintenance and light shade; winter color and drought resistance not outstanding, but adapts well generally.

Bonnieblue - Hybrid beauty from Rutgers, decumbent, with excellent color and long season; good disease tolerance and endures acidity.

Enmundi - Selection of high quality from Holland, noted for *Fusarium* resistance; decumbent, leafy, attractive even under low mowing; endures acidity.

Fylking - Swedish selection, elegant, decumbent, adapted to low mowing; some disease, but usually not too serious; has shown good salinity tolerance in California; not aggressive, so especially suited to mixtures and blends.

Glade - Selection from New York, low, dark , rather slow-growing; good in shade because of resistance to mildew; endures acidity; well-suited for blends.

Majestic - Handsome Rutgers hybrid, dense, strongly rhizomatous; excellent general qualities; among best in hot weather in California.

Merion - The original standard of excellence among bluegrasses; exceptionally dense and aggressive, wearing well; suffers from certain diseases, but has excellent resistance to leafspot; not a low-maintenance cultivar, needing generous fertilization; drought and iron chlorosis tolerance is good but salinity tolerance is low.

Nugget - Selection from Alaska, neat, dense, dark green; gives great summer performance, but greens late; best adapted northward; suffers somewhat from dollarspot and *Fusarium;* good in shade because of mildew tolerance; adapts to low maintenance.

Plush - Selection from New Jersey with moderate disease resistance that seems widely adapted; withstands low maintenance, drought and acidity rather well; a good general purpose cultivar.

Ram I - Discovered on a Maine golf course, endures low mowing and acid soils; good in blends and mixtures; spreads unobtrusively to make stout sod.

Sydsport - Vigorous, fairly broad-bladed Swedish introduction with excellent ratings in Europe and America; only mildly susceptible to most diseases; resists iron chlorosis much recommended for sportsturfs.

Touchdown - Highly thought-of selection from a Long Island fairway, becoming widely recommended; dense, low and strong even with only moderate fertilization (so may thatch a bit); resists disease well.

Perennial Ryegrasses, *Lolium perenne* - ryegrasses sprout quickly, but do not spread, and are generally not so hardy as bluegrasses in extreme climates. Almost all leading cultivars are polycrosses, most based upon germplasm developed at Rutgers. Compared to common ryegrass they are low-dense, rich green, winter hardy, and mow neatly.

Blazer - A dark green Pickseed proprietary, with good heat tolerance and nice appearance.

Citation - A Turf-Seed cultivar, resistant to heat and wear, companionable for mixtures.

Derby - An International Seeds variety rating highly nationally; among the top three in California.

Diplomat - A Loft cultivar of overall fine quality.

Fiesta - An excellent Pickseed proprietary that withstands stress and most diseases.

Manhattan - Whitney-Dickinson's definitive Rutgers polycross, utilizing bloodlines mostly proved by natural selection in Central Park; excellent hardiness; among top three in California.

NK-200 - A Minnesota selection by Northrup-King, noted for winter hardiness (may be weaker in hot weather).

Omega - A Turf-Seed cultivar attractive summer and winter; wears well.

Pennfine - A leading national cultivar developed at Penn State, competitive and especially strong in summer; among top three in California.

Regal - North American Plant Breeders proprietary, attractive and strong under summer heat.

Yorktown II - Lofts high-rating variety, elegant and durable.

Fine Fescue, *Festuca rubra* - Well adapted to dry, infertile soil and shaded locations; often suffers stress from summer humidity, so that permanency is better in northern climates. northern climates.

Banner - Rutgers 45-clone Chewings polycross, doing especially well under coastal conditions.

Ensylva - A spreading polycross from Holland, well adapted to mixtures.

Highlight - Handsome Chewings introduction from Holland, one of the most brilliant of the fescues.

Koket - A Chewings polycross from Holland, strong, generally untouched by diseases.

Ruby - A spreading fescue from Holland; most used in mixtures and for special purposes (e.g. roadside seeding).

Colonial Bentgrass, *Agrostis tenuis* - A natural ecotype that persists under minimum maintenance, **Highland.**

Creeping Bentgrass, *Agrostis palustris* - Two lawn types are of note, **Emerald** is a pedigreed pureline out of Congressional, attractive and not too demanding; and **Prominent** is an eight-clone Scandinavian selection that survives neglect and resists *Poa annua.*

Rough Bluegrass *Poa trivialis* - **Sabre** selected at Rutgers, is an excellent golf green winterseeding species; adapted to moist shade in the North

grass, and to a limited extent centipedegrass, are offered as seed.

Pure lines from seed are the norm with the temperate species of northerly regions. Except for bentgrasses and a few specialty cultivars, the grasses spread by underground rhizomes or are bunchgrasses. They accommodate well to mixed plantings (i.e. seed mixtures), which broadens adaptability and usefulness. For example, fine fescue in a mixture survives in dry shade on poor soil, while in more favorable habitat bluegrass contributes the stoutest of sods needing only moderate care. The new perennial ryegrasses look just as handsome as the bluegrass, and contribute quick-starting cover. A sampling of the modern cultivars of these favorite seeded lawngrasses is given in Table 1.

The new cultivar explosion has had monumental influence. Only a decade or two ago, there was little or no choice among lawngrasses, even though agriculture had bred select varieties for better yield and improved adaptability for years. Discovery of Merion bluegrass on a Philadelphia golf course about mid-century was an inkling of things to come. Here was a superior Kentucky bluegrass, but one that yielded seed sparingly so that its cost was appreciably higher. Would the public, accustomed to inexpensive lawnseed, pay a premium for quality? Although it seemed questionable at the time, the answer proved to be a resounding "yes."

The floodgates opened. In the South, Glenn W. Burton hybridized bermudagrasses to yield the "Tifton series" now widely planted. And, more adventurous American seedsmen, such as Jacklin with Fylking bluegrass from Sweden, started importing the premier selections of Europe. In the United States, legislation was not passed until late 1970 granting varietal protection to sexually propagated cultivars (i.e. from seed); European countries, profiting from years of such protection, had gained quite a head start in commercial lawngrass breeding. The gap has since closed, and, as might be expected, some of the better cultivars for America come from American stock.

The introduction of new cultivars has turned into a deluge, and it is reshaping turfgrass considerations throughout the country. A wide array of selections is now available, some of them specialized for certain regions or for certain usages, but all of them improvements in one way or another over the common grass of yesteryear. A new cultivar would not be brought to market if it did not show advantages, especially in tolerance to commonplace diseases, low-dense growth well suited to mowed turf, maintenance of genetic quality, and (with northern grasses especially) competitive production of high quality seed.

Still newer turfgrass cultivars will be bred, screened, and brought to market as demands of the future are met. In addition to the qualities enumerated, breeding for low-maintenance will receive much attention. Perhaps not too surprisingly, the same cultivars which show well under high maintenance often rate best under low. Expect more emphasis on bred-in insect resistance (disease tolerance has been the primary focus of pest mitigation by breeding so far), drought

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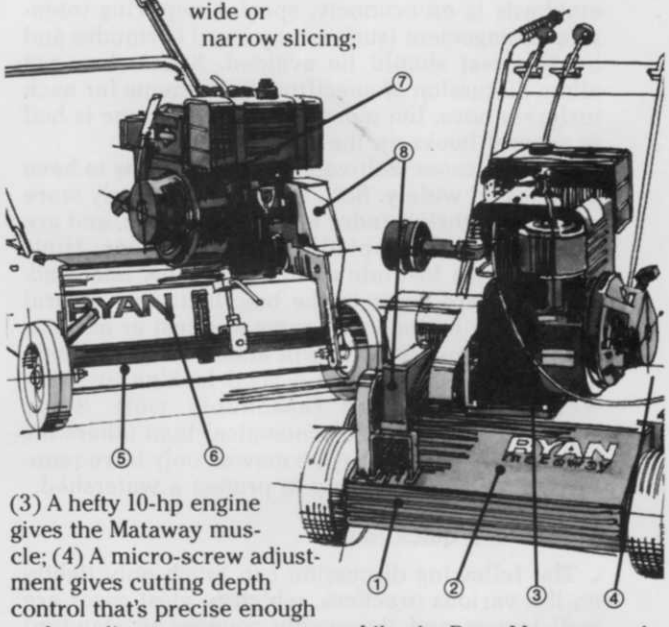

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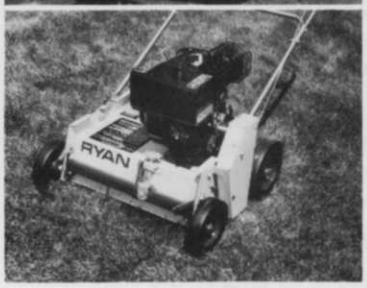

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tolerance, recuperativeness, quality (preferably without increased thatching), and so on. If large enough regional markets form, it may even prove feasible to mold cultivars for a particular pH, soil salinity, weather cycle, or similar local peculiarity of the environment.

While turf for parks and recreation runs the gamut from intensively managed golf greens to untended open space, most acreage calls for moderate maintenance. Well-timed seedings to a prepared soilbed can yield turf economically in northerly locations and also in the South with seeded grasses (such as common bermudagrass, and strains of bahiagrass) if they are given a bit of care. Where labor is scarce or unskilled and emphasis is on economy, species requiring intensive management (such as improved bermudas and bentgrasses) should be avoided. Space does not allow discussion of specific requirements for each turfgrass here, but more thorough coverage is had in several books on the subject.

In many cases, cultivars are still too new to have been tested widely. Still, some are obviously more aggressive, thrive under less maintenance, and are especially well adapted to certain regions. Hints for the Lawn Institute's Variety Review Board acceptances are given in the box. Including several cultivars in a blend (the same species) or mixture (more than one species) will almost surely provide potential these days for a good looking turf that wears and survives reasonably well. Some cultivars will be more economical than others for functional turf that may be mowed only infrequently and be meant merely to protect a watershed.

Turf care, a quick review

The following discussion can touch only lightly on the various practices, which in most cases are well known and thoroughly covered in standard advisories. I will attempt in the space available mainly to examine trends as they seem to be affected by the new lawngrass cultivars.

Mowing—By and large, trailing grasses, especially those clipped fairly low (3 centimeters or less), mow most neatly with reel machines. Rotaries are more flexible, and more easily maintained, for the less meticulously kept swards mowed 3 centimeters tall or taller. In general, high mowing is advantageous, the greater amount of green leaf thus retained contributing to vigor, deeper rooting, and better suppression of weeds. Newer cultivars are for the most part selected for more decumbent, denser growth than old fashioned grass, and can be expected to withstand somewhat more rigorous mowing that might be anathema to common sorts. Even so, 50 percent of the green foliage is the maximum that should be sacrificed at any one mowing; clipping should be undertaken frequently enough so as to assure this.

Of course, grass must be mowed to be called a turf, and it is clear that unmowed swards soon give way to weeds and brush. Experience with roadside berms shows that mowing quite tall, even if only a few times during the growing season, is adequate for functional cover, which is not viewed as being unsightly by most people so long as the contrasting vegetation (broadleaf weeds) is occasionally cleaned out with herbicides. Some new cultivars have been and are continuing to be selected primarily for proletarian uses such as berms and relatively untended open areas.

Weeding—One of the turf "miracles" of the last quarter century has been perfection of selective and preventive weeding. The 2,4-D (phenoxy) group of chemicals provided a breakthrough, in that these highly selective herbicides are lethal to most broadleaf plants (dicotyledons) at rates harmless to grasses. Thus it is not difficult to keep once ubiquitous dandelions, plantains, and similar pests out of turf. The phenoxy chemicals are deleterious to some southern grasses, especially St. Augustine, and in the southlands one should follow recommended local practices (in the South weeds may be a greater problem than in the North because of the longer growing season and the greater diversity of species).

Because of restrictions and costly development, flow of new herbicides to market is not what it was some years ago. A number have been prohibited as being hazardous. Yet, of all pest control measures, weeding with herbicides is most gratifying; it's labor saving, and not damaging to the environment if properly carried out. Silvex and 2,4,5-T have been banned by EPA; however, 2,4-D fortified with dicamba, mecoprop, or other additives serves remarkably well for freeing grass from dicotyledonous weeds. Several effective preemergence chemicals are at hand to stop annual grasses, such as crabgrass, worth the expenditure for prominent swards. Oxadiazon is one of the more recent, effective against goosegrass *(Eleusine)* as well as crabgrass *(Digitaria)*.

It is still difficult to remove perennial weed grasses from turfgrass, but glyphosate (and paraquat, on the restricted list) do a nice job of wiping out all vegetation prior to renovating with improved cultivars. Such are some of the labor-saving tools now available for managing turf, as applicable with the new cultivars as with common grass (slight differences in the risk of burn do show among cultivars). Some new cultivars are especially vigorous in fighting their own battles, in the image of Merion bluegrass. Few volunteer grasses or weeds gain entry into a flourishing turf of Touchdown bluegrass, for example.

Irrigation—For arid regions irrigation is essential if first class turf is to be had at all. However, functional cover can often be attained in the western plains with secondary species such as buffalograss *(Buchloe)*, gramagrass *(Boutelova)*, and wheatgrass *(Agropyron)*, with little or no watering. Even in humid climates where rainfall is usually ample, irrigation is nowadays demanded for more important turf plantings in order to keep them lushly green no matter what the weather. This is especially true for golf courses and athletic fields which must be ready for play "rain or shine." Installation or irrigation systems has become a highly specialized engineering operation. Most are underground, and many are equipped with automatic controls.

Continues on page 74

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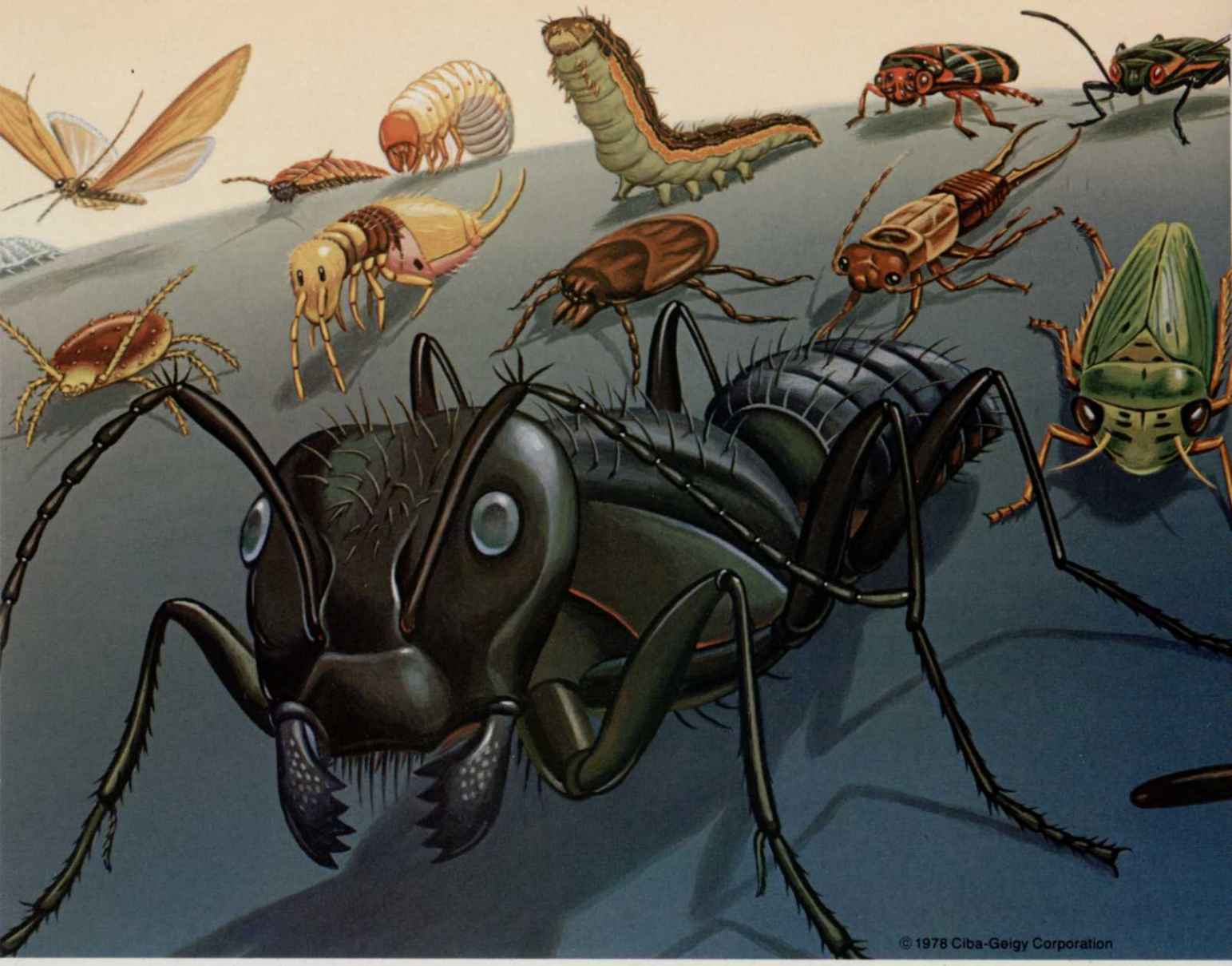

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MAPLES OFFER VARIETY, COLOR IN ELEVEN IMPORTANT SPECIES

by Douglass Chapman, Horticulturist, Dow Gardens, Midland, MI

The genera Acer is a most-widely used and well-known group of shade and/or street trees. The maples differ greatly when considering maintenance requirements (pruning, site and soil adaption, insect and disease resistance, and tolerance to pollutants (ozone, sulfur dioxide, etc.) and highway salt (chloride). We shall discuss eleven important Acer species and their cultivars.

Hedge Maple *(Acer campestre)*, an introduction from Europe, is effective when used as a hedge, low-branched specimen, or street tree. This dense, rounded tree often reaches 30 ft. in height. Its dark green summer leaf holds color late into the fall, seldom being blemished by insects, disease, or drought (leaf scorch). When Hedge Maple does develop fall color, which is rare, it is a clear yellow. This small, tolerant tree is one of the lowest maintenance trees and should be used more extensively as an urban landscape or street tree. It requires little pruning, tolerates poor sites, grows well under street tree conditions with no major insect or disease problems.

Amur maple *(A. ginnala)* is effective as a multiple-stemmed shrub or small tree. In Central

Bark of Paperback Maple (top) is an attractive addition to a landscape.
Japanese Maple (right) has unique branching and red foliage (insert above).
Striped Maple (insert right) is an exciting understory plant.

Michigan this round-headed tree normally reaches 18 to 25 ft. in height. The grayish bark helps to accent the rich green summer fall foliage as well as the yellow to scarlet color. Amur maple is perfectly winter hardy as far north as Traverse City, MI. It should be grown in moist, well-drained soil. There are no major insect problems, but verticillium wilt is a major disease and should limit slightly the use of this outstanding small tree.

Paperback Maple *(A. griseum)*, a native of China, is an outstanding small tree but borderline hardy in Central Michigan. This 25 to 30-ft. oval tree, with its cinnamon colored exfoliative bark which develops on three- to five-year-old plants, is a real addition to the year-round landscape. Paperback Maple can make the winter landscape more tolerable. It should be used as a specimen in protected sites and planted in fertile, well-drained soil. Fall color, which is a reddish-bonze, develops so late it is seldom effective. Although the plant requires little maintenance and shows tolerance to most insect and disease problems, it should be used sparingly. It is scarcely found in the trade because of its difficulty to propagate from seed.

Boxelder *(A. negundo)* which grows under the most adverse conditions is seldom used because of boxelder bug and soft wood. This round-headed tree, reaching 35 to 40 feet, can be grown as a low branched specimen or limbed up. If a male cultivar acceptable were developed, this plant could be used as a street tree, remembering it is somewhat shortlived (30 to 40 years). When the bright yellow fall color contrasts the relatively dark bark, this plant is breathtaking.

Japanese Maple *(A. palmatum)* is valuable for its unique branching, green-striped bark when young and gray bark at maturity, and unique leaf shape (varying from medium to fine texture). This round-headed 15- to 20-ft. plant is borderline hardy as far north as Central Michigan. Japanese Maple, grown as a specimen tree in a sheltered location with northeast exposure or part shade, can be a dependable plant.

Two outstanding cultivars are available in the trade. *A.p. 'Atropurpureum,'* the hardiest of the cultivars, has a light red foliage throughout the growing season 'Oshio-beni' is in demand for its rapid rate of growth and brilliant red foliage, but one should realize it is not as hardy. Many selections are available but are usually so confusing in the trade that simply asking for Japanese Maple is probably the best course to follow.

Striped Maple *(A. pensylvanicum)* is a northern native which must be grown in moist, well-drained soil. This 15 to 20-ft. small tree is an exciting understory plant or in a tree border. The large red buds and stems with green and white striped bark are outstanding winter characteristics. The yellow fall color can accent this uniquely branched plant. When in full bloom, this plant is outstanding with a somewhat weeping chain-like yellow flower. This plant should be utilized in tree borders or mass plantings and not as a specimen tree.

Norway Maple *(A. platanoides)*, a native of Europe, is outstanding when used as a street or park tree. Its upright, oval crown often reaches 50 to 55-ft. in height. Norway Maple is frequently used in the urban landscape, some suggest too frequently, but it is tolerant of salt, air pollutants (ozone, sulfur dioxide), heavy, poorly-drained soils, and rarely shows leaf scorch. Further, Norway Maple grows rapidly, is relatively free of insect and disease problems, needs little pruning, and has many outstanding cultivars available in the trade.

The main detractant of Norway Maple is the recent increase in reported deaths due to verticillium wilt. This plant rarely develops fall color, but when it does, as it did in 1979, it is an exciting clear yellow.

There are many outstanding cultivars of Norway Maple. 'Cleveland' Norway Maple has dark green summer foliage, showing little or no leaf scorch. This 40-ft. tree is almost perfectly oval at maturity and is good as a shade, specimen or street plant. 'Summershade' is a rapid growing cultivar which maintains a good central leader. This cultivar shows exceptional heat tolerance, making it outstanding as a street tree.

'Crimson King' is the most vigorous of all the red-leaved forms. It maintains the red leaf color all summer, is heat tolerant, and is effective as a specimen or street tree.

'Schwedleri' was one of the first of the maroon types. It has bright maroon leaves during the spring which contrast the light green flowers. The summer foliage is dark green. The silhouette of 'Schwedleri' is wide and spreading, almost perfectly round. 'Columnare' Norway Maple is outstanding as a border specimen or street tree. This narrow, upright selection reaches 60-ft. in height with only 20-ft. in width. It has demonstrated good heat tolerance.

Planetree Maple *(A. pseudoplatanus)* has a round habit of growth, reaching 40 to 60-ft. in height. Its unique leaf shape makes it an outstanding specimen plant. It thrives on well-drained soils in full sun, thus limiting it to a landscape or park tree.

Red Maple *(A. rubrum)* is outstanding as a specimen or street tree. This 65 to 75-ft. upright, oval tree tolerates heavy, poorly-drained soil and has a range from northern Florida to Michigan's Upper Peninsula. The gray bark, accented by brilliant scarlet fall color, is reason enough to use this tree. It does require frequent pruning and shows little tolerance to air pollution. It is not a good selection for downtown urban conditions. There are many outstanding cultivars of this tree, but in recent years, graft incompatibility is limiting its use. Since it can be propagated by cuttage, the industry should actively look at trees grown on their own root system and develop cultivars adapted to sec-

Maples *from page 49*

Sugar Maple becomes rounded at maturity at a height of 70 feet.

tions of the country, e.g. Great Lakes. The ability to propagate by cuttage and work with known, hardy selections should greatly increase the use of this highly qualified plant.

Some of the selections available in the trade include 'October Glory' and 'Red Sunset', both displaying outstanding fall color. 'Columnare' ('Bowhall') is a good narrow, pyramidally-shaped tree with bright red fall color that has received high ratings from the Shade Tree Evaluation Tests in Wooster, OH.

Silver Maple *(A. saccharinum)* is a native fast growing specimen, usually 50 to 70-ft. in height, becoming oval to round as the plant matures. The interesting gray bark, deeply serrated leaf, rapid rate of growth, tolerance to poorly drained sites, make this plant ideal as a specimen or street tree. Some selections of this plant can have exciting yellow fall color.

Silver Maple is a high maintenance plant which requires continuous corrective pruning (every three to four years) with wood susceptable to decay, e.g. forms a poor compartment, further compounding the need for continuous pruning (branches under two in.) If this plant is grown correctly in the nursery, (grown for two years, cut off, and regrown as a single stem, high-branch plant) it can effectively be used in urban landscapes. One must understand its limitations to be excited about the plant.

Sugar Maple *(A. saccharum)* is a 65 to 70-ft. specimen plant with a somewhat rounded habit of growth. When young, the branching is somewhat upright to oval, becoming more rounded at maturity. Leaf color is usually a medium green in summer, changing to brilliant yellow-orange or scarlet in the fall. Although this plant does not require pruning, it is not tolerant of salt, heavy soils, or restrictive urban conditions. It should be grown in open, well-drained fertile sites (parks).

Black Maple *(A. s. nigrum)* , a sub-species of Sugar Maple, thrives in lowland conditions, is extremely heat tolerant,and requires little pruning. This 75-ft. rounded tree can be used equally as well as a street or specimen tree. The summer foliage is a dark green leaf with little fall color developing. If fall color does develop, it is usually a darker uniform yellow.

When considering maintenance requirements or tolerance to environmental stress, the maples are rather easy to rank. If pruning and low maintenance are main criteria, the order of ranking would be Norway, Hedge, Sugar, Amur, Planetree, Japanese, Red, Boxelder, and Sugar Maple.

When considering site adaptation or tolerance to urban conditions, the plants would rank (from high to low) Hedge, Norway, Boxelder, Silver, Red, Amur, Sugar, and Japanese.

If the plants are near where highway salts (sodium or calcium chloride) are regularly applied, then their ability to withstand these conditions would rank (from tolerant to intolerant) Norway, Hedge, Boxelder, Red, Silver, Amur, Japanese, Planetree, and Sugar Maple.

In making this decision, air pollutants should also be considered if sulfur dioxide is a problem. The tolerant to intolerant rating goes from Norway Maple being very tolerant to Planetree, Hedge, Silver, Sugar, Red, Boxelder, Japanese Maple showing little tolerance. The air pollutant ozone is becoming more common and affects the maples differentially with Norway Maple being most tolerant and Sugar, Boxelder, and Red Maple being least tolerant.

It is clear to see that several of the maples are outstanding in almost every category but in certain situations, each one of the eleven would be the prime tree to use. The main consideration should include selecting the maple that is best adapted to the conditions and the level of maintenance one is able to provide with an eye toward diversity.

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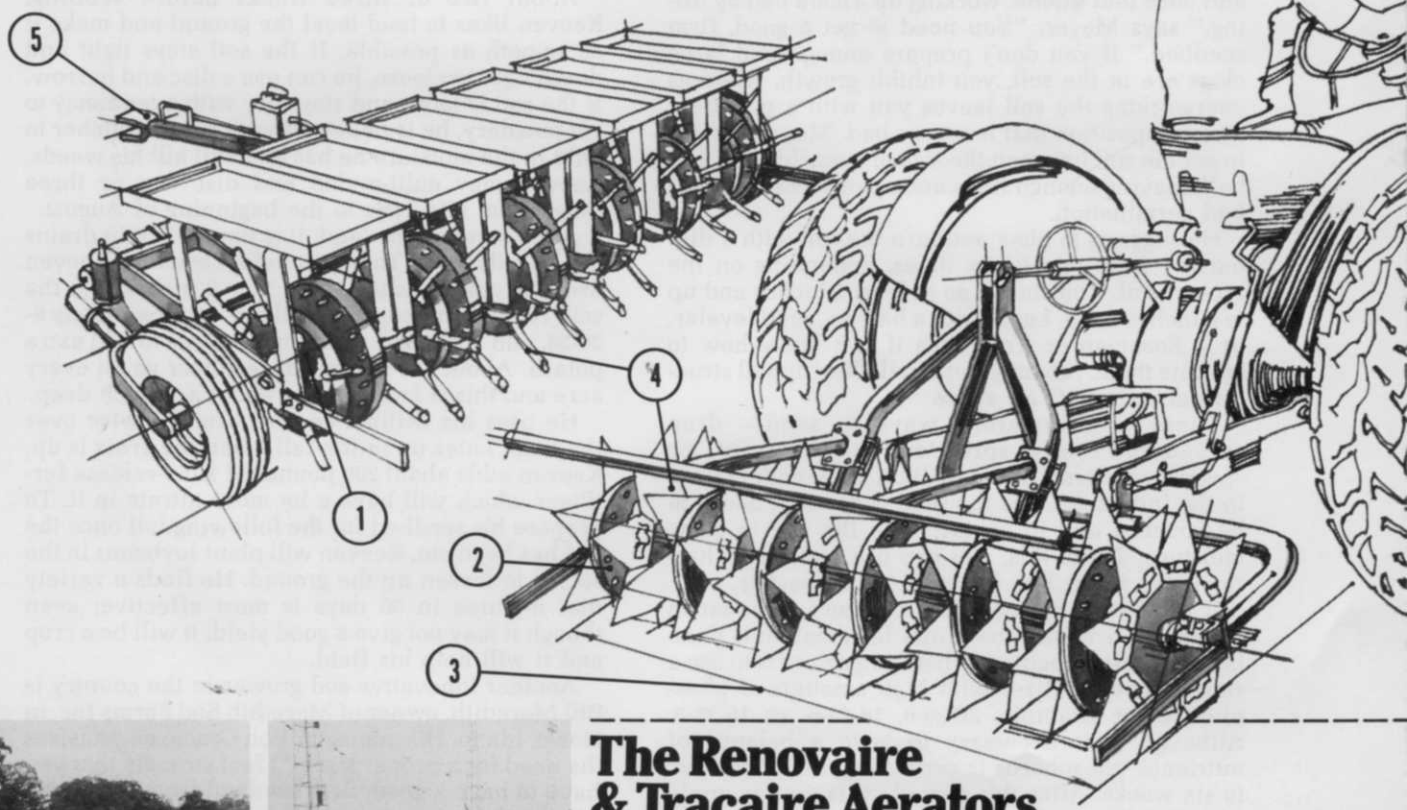

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GOOD, STRONG SOD STARTS WITH A WELL-PREPARED SEEDBED

By John Kerr, Assistant Editor

Sod producers have come a long way in the past 10 years to make their industry respectable and profitable. Their own ingenuity along with research from extension agents and turf specialists has helped them produce a solid, saleable crop. Technologies differ slightly for each area of the country because of varying soil, rainfall, and type of seed, but the basics remain unchanged. To prepare a good seedbed, a sod grower must know how to properly manage these factors.

The starting point in growing good sod is a soil analysis, according to Eugene Meyer, turf specialist at O.M. Scott & Sons, Marysville, OH. It is an easy thing to obtain since every state has soil laboratories and commercial industries have soil testing services. You must also start out with a quality, clean seed and a good variety or else you will have problems to counter through the full growing cycle.

"The main thing is getting an established grade, and once that's done, working up a good bed by tilling," says Meyer. "You need to get a good, firm seedbed." If you don't prepare enough and large clogs are in the soil, you inhibit growth, whereas overworking the soil leaves you with a powdery, fine composition that is just as bad. Meyer prefers to get the soil between the size of a marble to a golf ball, leaving enough fines and open areas for seedbed germination.

He suggests to plow and turn the soil with a disc harrow from one to six times, depending on the type of soil. You should go at least 2 inches and up to 6 inches deep. Level with a harrow, land leveler, or a Roseman or York rake if you know how to operate them. A heavy roller will destroy soil structure and shut off air space.

There are numerous ways to seed— drop spreaders, rotary spreaders to broadcast, or specific seeders like the Brillion, most widely used in the industry. Once the seed is down, it needs to be covered and in contact with the soil to draw moisture. To do this, you can use some light harrowing, a chain link fence, or a cultipacker.

It is Meyer's opinion that it doesn't make much difference whether the initial fertilization is done before or after seeding. What's important is to use a starter-type fertilizer with high amounts of phosphorus, for example, 20-26-6, 18-24-6, or 16-21-5. Although it is necessary to have a balance of nutrients, phosphorus is very critical the first four to six weeks. After this period , it is time to apply more fertilizer, primarily high in nitrogen.

After seeding, water is the most critical factor for seedbed germination, as long as you have warm weather, Meyer says. The beds should be kept moist for the first 30 days, not allowing any lengthy dry periods. You should mow once the turf reaches 2 to 2½ inches, and after maturing, keep it at about 2 inches. It will be ready for harvest when you can pick up a corner of a piece and it stays together.

"I think most sod growers do a relatively good job," Meyer says. "Sometimes they'll try to outguess mother nature." Planning ahead helps you work around weather patterns. For a fall planting, the prime time (the last week of August and the first three weeks of September in Ohio), you should make important decisions in the early summer.

Ed Keeven, owner of Emerald View Sod Farm outside of St. Louis, exemplifies the planning and expertise of 26 years of turf farming. For his fall planting, Keeven plows or chisel plows by the 15th of June, then disc files to let the weeds come up. "It's a good way to do summer fallowing," he says.

He uses a culti-mulcher or disc to tear his weeds up and this dries them out before seeding time. It is much cheaper to do this and use herbicides than fumigate, which can cost $800 an acre. "With all the herbicides available today, you can control any type of weed," he says. Two in particular are Dacthal for preemergent crabgrass control and Balan which goes on after the grass has been mowed at least twice.

About two or three weeks before seeding, Keeven likes to land level the ground and make it as smooth as possible. If the soil stays tight and doesn't get too loose, he can use a disc and harrow. If the soil is loose and stays dry with a tendency to get powdery, he is better off with a cultimulcher to hold in the moisture he has and still kill his weeds. Keeven may culti-mulch and disc two or three times from mid-June to the beginning of August.

After leveling the land, it is time to put in drains if he needs them. Then just before seeding, Keeven uses his cultimulcher about 2 or 3 inches into the soil. He adds his starter fertilizer, approximately 6-24-24, and will mix his own if he wants to add extra potash. About 300 pounds of fertilizer go on every acre and this is harrowed in about a ½-inch deep.

He uses his Brillion seeder, usually twice over the land. Later on in the fall when the grass is up, Keeven adds about 200 pounds of slow-release fertilizer which will have a lot more nitrate in it. To prepare his seedbed for the following fall once the sod has been cut, Keeven will plant soybeans in the spring to loosen up the ground. He finds a variety that matures in 90 days is most effective; even though it may not give a good yield, it will be a crop and it will help his field.

Another innovative sod grower in the country is Bill Meredith, owner of Meredith Sod Farms Inc. in Howe, Idaho. His manager, Bob Grace, emphasizes the need for a proper start. "I feel strongly that you have to have a good, firm seedbed from the beginning; otherwise, you're fighting it all the way through."

Grace says, "It's important to spend a lot of time and preparation in the seedbed because you want to ship a 20 by 40-inch slab of sod which has no bumps in it or tears from the sod cutter. If you have a good firm seedbed and not too loose, the seed will stay in one place better."

In the loamy clay soil of the Rocky Mountain west, a base with very little organic in it, the

Continues on page 57

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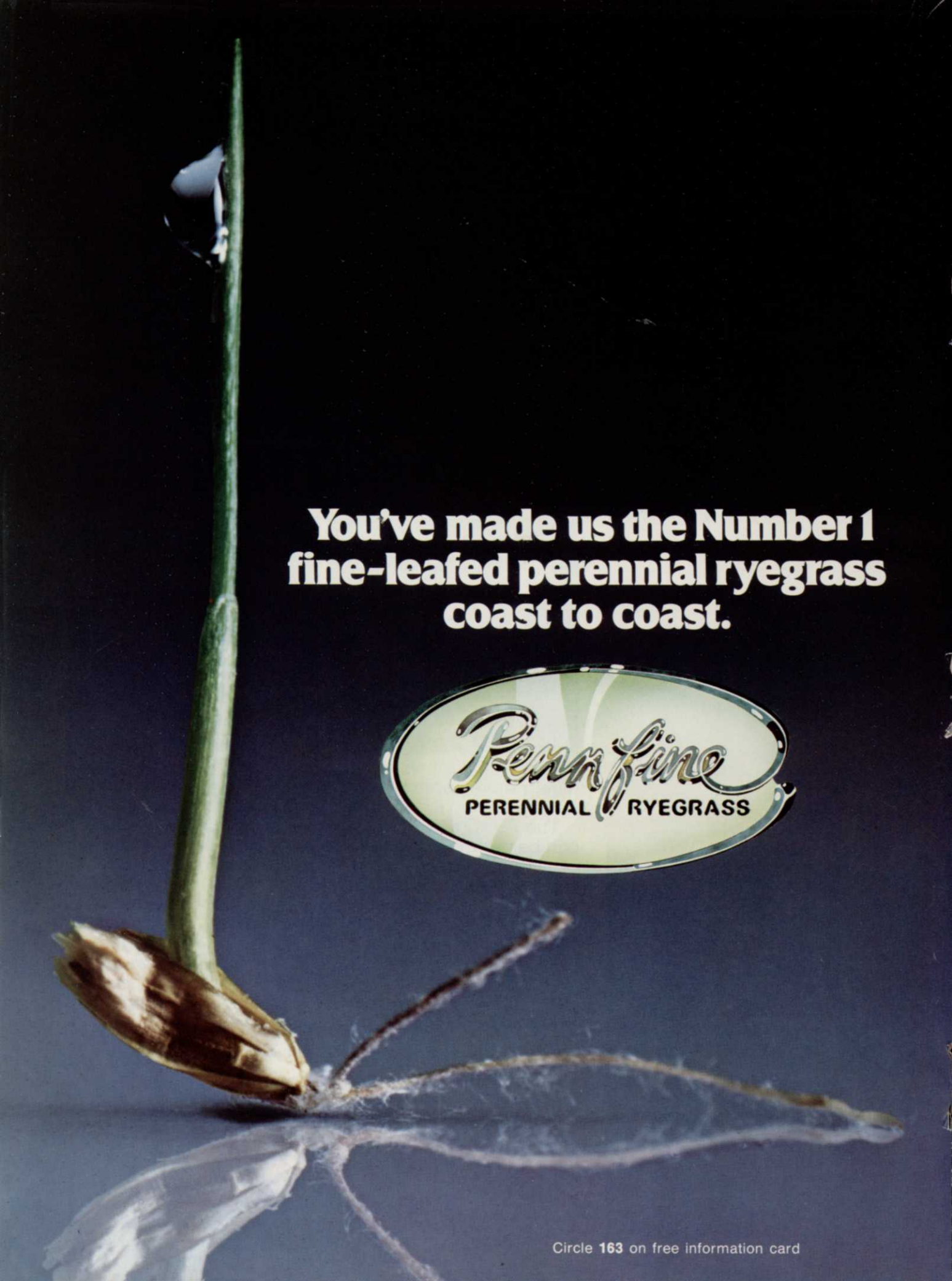
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Seedbed *from page 52*

Meredith farm grows a healthy crop. Meredith uses plenty of fertilizer to get the most out of his soil. He and Grace have also adapted their own wheels for the Brillion seeder, which they claim saved them $36,000 last year on 560 acres.

With the standard Brillion seeder, Meredith thought that the grooves it made in the front which were filled with seed, got buried from the rear roller. He thinks his own wheels can save on seed, which is especially important to places such as California where the land is expensive and intensively grown. One California grower has cut his seed from 120 to 80 pounds an acre, Meredith says.

Another piece of equipment that Meredith has developed for his operation is a sod washer. Since it costs more to truck sod than to raise it, he finds washing away much of the dirt can be a big saver. He has never promoted it because of the tremendous marketing problem. If you use it, you have to get the sod down immediately or else refrigerate it.

One area to use washed sod is in football stadiums. At the Denver Bronco stadium, a crew removed 6 inches of dirt, put down plastic, and then put in heat pipes, drain pipes, and feed pipes and covered them with sod. Now it has complete protection against the elements. If it snows, you turn the heat on; if it rains, you suck it dry. You can also fertilize and water the turf from underneath.

To avoid the labor in moving sprinkler pipes and get uniform watering, Paul Unruh and his crew at The Turf Farm in Minden, Nevada, have devised an underground system with pop-up heads. "It lets you plow in areas where you want low cross depth," says Perry Lemmon, sales manager. You can water the land at any time, irrigating from your home if you choose. Nobody has to walk on the turf to move the pipes once they've been installed and the labor crew will not have to be called in on a Saturday or Sunday to operate the system.

"We try to hold 2½ gallons to 7 or 8 gallons a sprinkler per minute," Lemmon says. This all depends on the type of soil. The system must be adapted for each type of soil since some take moisture faster than others. Being 18 inches below the ground also eliminates conflict from equipment.

Lemmon thinks the sprinkler system gives a more uniform coverage because all the sprayers can function simultaneously and wind won't affect them. This means the grower can get efficient use of his water and won't have to irrigate as often. It is a concept that its designers have considered for five years but just started marketing last October. Lemmon says growers are already finding success with it.

Dr. Robert Shearman, an extension turfgrass specialist and assistant professor of horticulture at the

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University of Nebraska, has worked with many sod growers in his region. He says the key things to remember for cool-season grasses, such as bluegrass, are to prepare a good seedbed, uniformly distribute the seed, understand nutrient needs for establishment, select the best blend of cultivars for rapid establishment (or those not as fast, but which develop strongly), and post-emergent care such as weed control, fertilizing, frequent mowing, and sufficient moisture.

Shearman has been looking at fertilizer application for preparing a seedbed, and comparing surface application to mixing for a homogenous blend. "With starter fertilizers with a high phosphorus content, you need to apply those to the surface and not blend into the upper 2 to 6 inches," he says. "The reason is the new seedling needs nutrients close and readily available. Often phosphorus gets chemically bound in the soil so it's unavailable for the plant roots, particularly new seedlings which don't have an extensive root system."

"Poorly prepared seedbed with large clogs in them are going to block seeds out; they won't have good soil contact," he continues. "The situation has been to work soil down to a fine granular, almost powdery material. That gives a good seed-to-soil contact but destroys a number of the physical properties of the soil beneficial later on. The tendency now, particularly in large areas, is not to work the soil as fine." This would depend on the type of soil, since a sandy soil will work down to a fine substance more than a clay or loam.

Work with preemergent herbicides on seedbeds has revealed both positive and negative effects. Shearman has studied Siduron, which is recommended for cool-season grasses to prevent warm-season weeds, particularly crabgrass. It controls the detrimental weeds but also suppresses the establishment of desirable grass. "If we have to use it, we up the seeding rate 10 percent because it decreases the percent of germination, increases the number of days it takes for the seedling to emerge, and reduces the amount of rooting seedlings have," he says.

One approach Shearman suggests is to get the seed planted earlier so you don't have to use a preemergent herbicide, but only a regular herbicide. "I don't feel you should use any pesticide indiscriminately," he says. On Kentucky bluegrass, four or five weeks after the seedling emerges, you can use 2,4-D or combination products like Trimec for control of broadleaf weeds with minimum injury to desirable grass, according to Shearman.

Like his colleagues, Dr. Donald White from the department of horticulture and landscape architec-

Continues on page 60

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Seedbed *from page 58*

ture at the University of Minnesota, stresses an assessment of phosphorus needs. He thinks it's important to till phosphorus into the root zone from the beginning. "Some growers wait until the turf is growing to add phosphorus and it doesn't move in the soil very regularly," White says. "When you remove sod, you remove phosphorus." Dr. Jack Butler from the department of horticulture at Colorado State University thinks adding phosphorus can increase your initial growth by 200 or 300 percent.

Minnesota sod producers have variety trials on a cooperative basis under their own care and soil conditions.

White thinks that nitrogen, in its soluble form, should always be applied to the surface. He recommends applying a half pound of nitrogen to 1,000 feet of surface and mix that in to the top ½ inch of the soil.

To help pick out the right type of cultivars, people ought to check with their local extension service and state university. "With energy and inflation problems, you're probably better off with a common and intermediate type of Kentucky bluegrass because they require less fertilizer," White says. They survive better through low maintenance. He suggests a mixture of two or three varieties with at least one shade-tolerant bluegrass.

In Minnesota, the sod producers have variety trials in their fields for cultivars. It is a practice that doesn't take much time but can be very profitable. The growers have what they want to experiment with under their own care and their own soil conditions, and can help each other with their findings.

White looks at this type of cooperative experimentation as an easy, effective aid for the sod farmer in the future. Yet for the ones who are successful, and many have found the right formula for their particular situation, they must really assess their needs if they decide to do things differently. "If you're doing things right, there's got to be a darn good reason for you to change," White says. **WTT**

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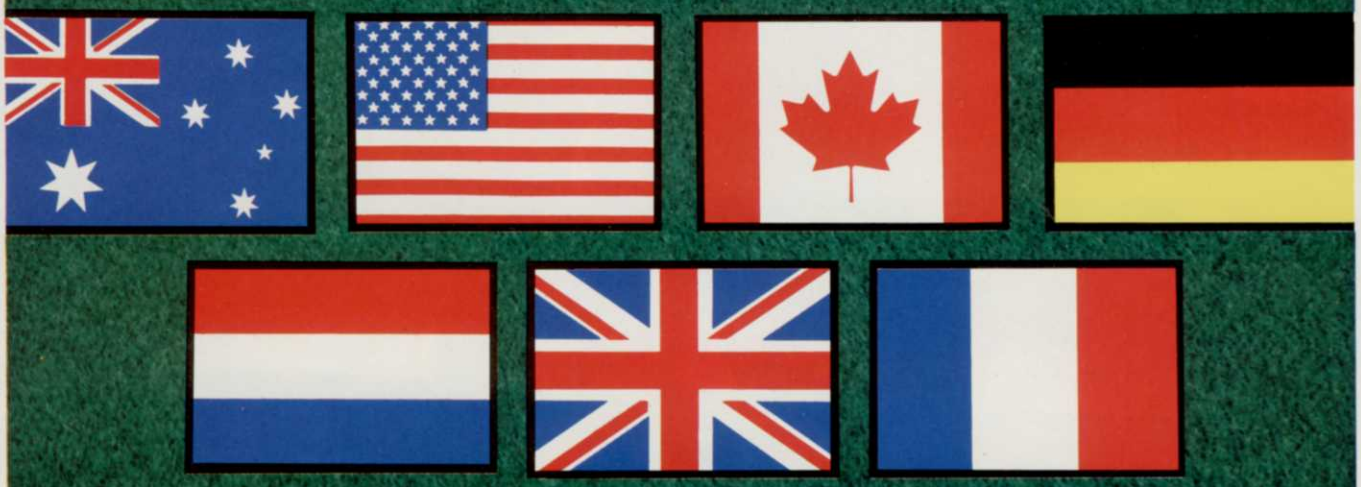

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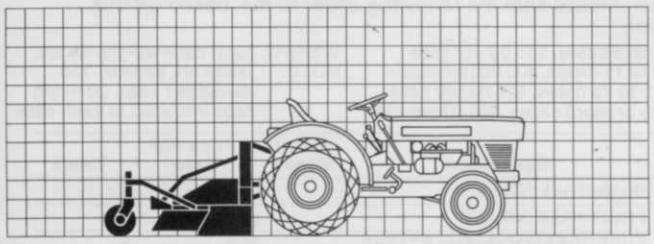

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By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

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A: I can think of no way other than digging and inspecting the root system, which is rather drastic a measure unless you have reason to suspect a problem.

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A: Rodent baits are available in a number of premixed forms, loose grain, paraffin pellets or blocks, and nonparaffin blocks or pellets. You may write to the Rodent Control Fund, Agric. Experiment Station, W. Lafayette, IN 47906 or you may want to contact a few of the following manufacturers of these products:

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Q: *What can I use to control speedwell and ground ivy, now that Silvex is no longer available?*

A: Dicamba (Banvel), although it is not recommended for application on turf over the root system of trees and shrubs.

Q: *In the tree industry, there seems to be two opposing opinions to trunk injections for nutrients, Dutch elm disease, and insecticides. What is the latest information?*

A: Any break in the bark that exposes the wood can be considered a wound, and all wounds can serve as an entrance for decay organisms. Among the factors that can affect the resultant discoloration and possible decay following injection are tree species, time of year of injection, material injected, tree condition and the wound type, location, and number.

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Q: *Bermudagrass got started in the fringes of our country club and is now growing into the greens. Is there some way we could kill the bermudagrass?*

A: You cannot selectively kill the bermudagrass with chemicals. Nonselective herbicides such as Glyphosate (Roundup) can be used to spotkill the infested turf area, followed by reseeding or sodding.

Q: *Virginia is in a strange growing zone. It is neither cold like the North nor real warm like the South. Can you help?*

A: Much of Virginia is located in the Transition Zone where some species of both cool-season and warm-season grasses grow where neither is well adapted.

In general, cool-season grasses such as Kentucky bluegrass and creeping red fescue are better adapted to northern Piedmont and areas west of the Blue Ridge Mountains. Warm season grasses such as Bermudagrass and zoysia are better adapted to eastern Virginia and southern Piedmont except in shaded areas.

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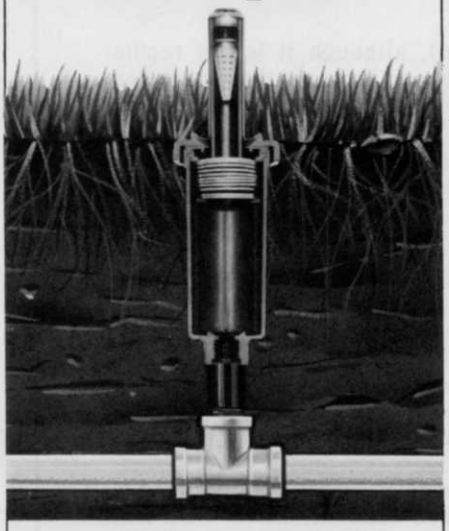

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WTT

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Green Industry News *from page 14*

INTERIOR

New association gets organized

The Interior Plantscape Association, formed last spring, is picking up momentum with membership of more than 150. IPA President Harry Belin says an interior plantscape show is being arranged for September in Dallas, TX, and that a operations manual is being developed with the idea of certification in the next year or two.

IPA attracted 400 interior plantscape specialists to its first meeting in Atlanta when it was only 250 days old. Association director Carol Felix keeps daily tabs on IPA affairs from its Reston, VA office.

The group publishes a newsletter each month.

There are four membership categories; active, allied trade, allied associate, and sustaining. Dues ranges from $50 to $150 per year. Persons interested should contact IPA, Suite 14, 1601 Washington Plaza, Reston, VA 22090.

PESTICIDES

Specialist lists guides for handling pesticides

Pesticides and other chemicals, which are used extensively in the Green Industry, can be dangerous if not handled or applied properly. According to extension specialist Glenn H. Hetzel, a variety of pesticide handling guidelines should be followed, Including:

- Everyone involved in applying organophosphorus pesticides should exercise extra care and should get a cholinesterase blood test before the work season to establish their baseline. Then, if poisoning symptoms occur, further blood tests will show changes in cholinesterase, which could indicate poisoning from organophosphorus materials.
- All pesticides should be stored separately from other supplies, materials, tools, or normal work areas. The storage area should be cool, dry, and locked whenever unattended. If possible, the storage area should be a separate building of fireproof construction and should be vented to the outside. Further, signs should be posted to indicate that dangerous materials are stored there.
- Pesticide training should include the symptoms of pesticide poisoning. Proper protective equipment and clothing should be provided and required for anyone handling pesticides. Those mixing and applying pesticides need more protection than those who move the material into or out of storage. Always follow the instructions on the label and note the toxicity level when making decisions on what precautions are needed for a specific pesticide.
- When mixing pesticides, the use of splashproof goggles, gloves, and apron are mandatory. When mixing organophosphates and other highly toxic pesticides, a full face shield, clothing to cover arms, and the proper respirator are necessary. Since pesticides are absorbed through the skin, as well as inhaled, every precaution should be taken.
- Special care should be exercised when applying pesticides. Herbicides are probably less dangerous to the applicator because large droplet size and lower pressures are normally used. However, insecticides are usually more likely to be applied with higher pressures and smaller droplet sizes This leads to a greater likelihood of spray material blowing or drifting. Consequently, the operator must check wind conditions, as well as the proximity of other humans and animals. Highly toxic pesticides should not be used on windy days and usually not immediately before a rain because drift and runoff could cause disastrous effects. If fine mists are being created, full protective clothing and equipment should be used. Boots and leg protection are necessary for all ground applications.
- No pesticide should be applied until the application equipment has been calibrated. Any change in operating pressure, nozzle size, forward speed, height of boom, concentration of the pesticide, or mix ration will require recalibration of the equipment. Excessive amounts of pesticides could cause harm to

Continues on page 68

ARBOTECT® 20-S
The strongest Dutch elm disease protection you can give a tree.

ARBOTECT 20-S fungicide helps make it possible to save many elm trees that otherwise would be lost.

Injected into the trunk of the tree, ARBOTECT builds a barrier against Dutch elm disease inside the tree itself. It helps prevent the disease in healthy elms, and can often save infected trees if they are treated early enough.

Used along with sanitation, insect control, and root graft elimination, ARBOTECT can significantly improve the effectiveness of a Dutch elm disease control program.

ARBOTECT differs from other elm fungicides in several important ways:

- It is registered at rates high enough to be effective.
- It is concentrated, requiring much less water for injection, so trees can be treated much faster.
- Thiabendazole, the unique active ingredient in ARBOTECT, is highly effective against *Ceratocystis ulmi,* the fungus that causes Dutch elm disease.
- Even though it is more effective and convenient, ARBOTECT costs about the same to use as other elm fungicides.

This year, put ARBOTECT to work in your disease control program. It's the strongest protection you can give an elm against Dutch elm disease.

Arbotect
Strong protection for elms.

MERCK

Agricultural Products
Merck & Co., Inc. P.O. Box 2000
Rahway, New Jersey 07065
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animals, humans, or plants. Careful selection and use of pesticides must be the standard operating procedure.

- All people working with pesticides should develop the following habits: 1.) Never smoke or handle any food before washing hands. 2.) Do not place food near pesticides or in areas where pesticides are stored or mixed. 3.) Follow the 3-30 rule when mixing pesticides. That is, rinse the pesticide container three times and allow it to drain 30 seconds between rinses. 4.) Change clothes daily and do not wear any clothes that have been exposed to pesticides until they have been laundered. Contaminated clothing should be handled and washed separately from other clothing.
- Equipment used for mixing or applying pesticides should be thoroughly washed and decontaminated after use or before repairs are made. This is especially true when applying toxic substances. Mechanics or service people should be warned about the need for practicing good hygiene when making repairs or adjustments to chemical applicators.

GOLF

Carol McCue receives Herb Graffis Award

Carol McCue, associate executive director of the Chicago District Golf Association, shared the spotlight with the gentleman for whom the honor was named in November when she received the 1979 Herb Graffis Award.

The appearance of the National Golf Foundation's co-founder and one of the world's greatest golf writers and humorists thrilled Ms. McCue as well as 275 others who attended the awards banquet.

Ms. McCue, in her own words, has done for the CDGA "just about everything in the office, starting tourneys, writing releases and correspondence, and working with Chicago District Golf Charities and people who design courses."

Graffis had recently lost his wife Dorothy, when she died October 6 in Fort Meyers Beach, FL, at the age of 86. They had been married 62 years.

MARKETING

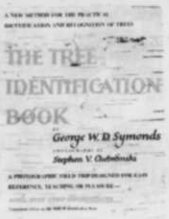
NMC advertising will increase sales

According to results of final consumer research tests conducted by the Nursery Marketing Council, the nursery industry can expect NMC radio advertising to generate at least $195 million in new purchases of living plants, related products, and services over a three-month advertising period. This is based on a 5 percent increase over current sales.

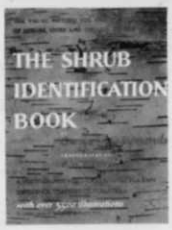
This news comes following completion of the intensive two-year study by NMC to determine how much advertising will be required to break through all other messages to consumers, capture their attention, and most importantly, move them to

Continues on page 71

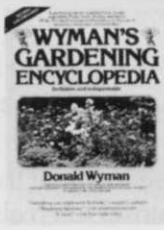
Technical & Instructional Books



Tree Identification
by George W. D. Symonds
A pictorial key to trees with more than 1,500 illustrations. With this book you can identify trees by looking at leaves, buds, branching, fruit and bark.
Paperback—$8.00



Shrub Identification
by George W. D. Symonds
Same as The Tree Identification Book on shrubs. Contains more than 3,500 illustrations from which to make identification.
Hardback—$18.00
Paperback—$8.00



Gardening Encyclopedia
by Donald Wyman
This revised, updated edition includes information on gardening practices, plants, methods of cultivation, fertilizers, and pesticides. 1,200 plus pages with 10,000 articles, 200 drawings, 170 photos.
$25.00

Home Landscape
by Garrett Eckbo
Provides designs examples, and current innovations and refinements to older traditional designs. Covers all aspects of residentail landscape design. $16.00

Ornamental Conifers
by Charles R. Harrison
More than 550 photos with plant descriptions and complete notes on their cultivation in both hemispheres. $20.00

Exotic Plant Manual
by Alfred Byrd Graf
A pictorial reference for plant identification of the best in cultivated tropicalia. Plants are grouped into growing locations and uses.
$37.50

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Master Charge or Visa (Circle one)
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(Allow 6-8 Weeks Delivery. Prices Subject to Change)

Please send the following books. I have enclosed a check or authorized a charge for the total amount.

Title	Quantity	Price	Total Price

Add $1.25 per book for handling and shipping _____
Total Enclosed _____

Groundsmaster 72®. We engineered this Professional to mow up to 3.7 acres an hour without losing its cool.

If you're responsible for large areas of turf, you have grounds to buy our Groundsmaster 72®.

In fact, Toro engineered this rugged 72" rotary specifically for your needs.

We built-in plenty of power for all types of cutting conditions.

We made its engine water cooled to give you longer service life.

We designed it to trim close to fences, walls, buildings and trees.

And we added versatility. With optional accessories including a 48" snowthrower, V-plow, rotary broom, roll over protection system (ROPS), and cab with ROPS.

Want a demonstration of the Groundsmaster 72®? Or our Groundsmaster 52® that mows like a garden tractor and trims close like a walk mower? Call your Toro distributor. Or mail the coupon.

TORO®

The Professionals

Tell me more, Toro.

I'm interested in a free demonstration of the Groundsmaster 72®. Please have my distributor call me.

Name _____

Company _____

Address _____

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State _____ Zip _____

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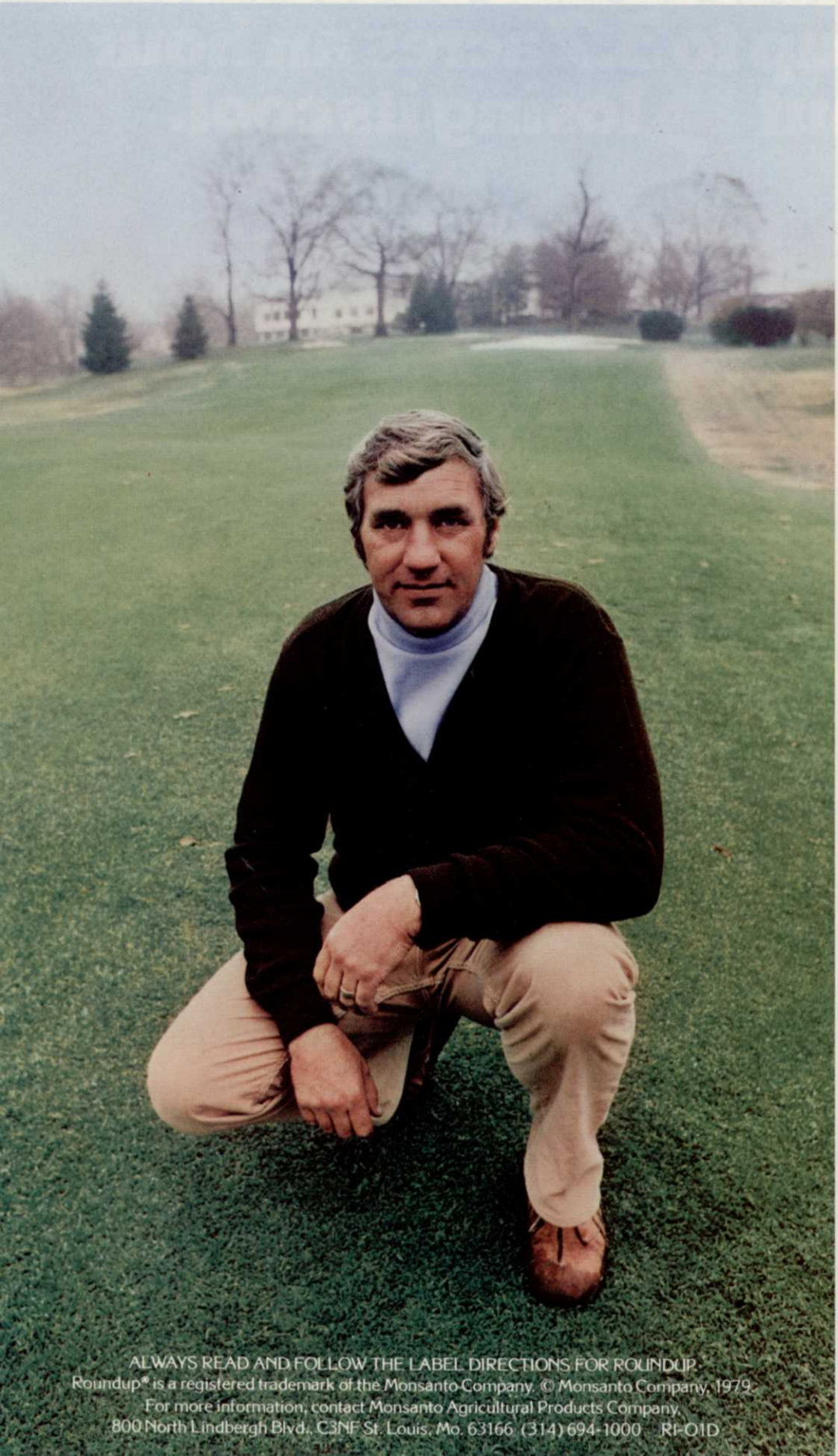
area code number

Mail coupon to: The Toro Company
Commercial Marketing Dept. WTT-020
8111 Lyndale Ave. S., Minneapolis, MN 55420

Circle **142** on free information card

How Roundup® helped Jim Siegfried renovate this fairway in days, without closing it for one minute.



Take a good look at this good-looking fairway.

Last fall, Jim Siegfried found a way to clean it up, without tearing it up—at the height of his club's busy season. With Roundup® herbicide by Monsanto.

Jim is the Greens Superintendent at Losantiville Country Club, Cincinnati, where bermudagrass had become a serious problem on the 18th fairway. To control it, Jim applied Roundup once—while the weeds were still actively growing—right at the start of the Labor Day weekend.

"That's really 'prime time' here," Jim told us. "But after we applied Roundup, we kept the fairway in play the whole weekend, and after. The members played right over it, with no problem."

Since Roundup has no residual soil activity, and won't wash or leach out of treated areas to injure desirable plants, Jim simply took normal precautions against spray drift—and didn't worry about damaging desirable vegetation along the fairway.

Even better, he was able to reseed right into the dying bermudagrass only 7 days after applying Roundup—without loss of playing time or inconvenience to the membership.

Reinfestation won't be a big problem for Jim, either. He knows that Roundup destroyed the rhizomes of the treated weeds, helping prevent their regrowth.

Jim thinks he'll use Roundup again this year—and apparently some club members hope so, too. "As soon as they saw how good this fairway looks, some of the members started asking when I'm going to do the same for #10, where we have some more bermuda. I'll probably tackle that with Roundup this fall."

If controlling many tough emerged weeds and grasses is a problem for you, see your local Monsanto representative or chemical dealer soon for your supply of Roundup.

Roundup. It worked for Jim Siegfried. It can work for you.

Circle **129** on free information card

Monsanto

There's never been a herbicide like this before.

ALWAYS READ AND FOLLOW THE LABEL DIRECTIONS FOR ROUNDUP.

Roundup® is a registered trademark of the Monsanto Company. © Monsanto Company, 1979.

For more information, contact Monsanto Agricultural Products Company, 800 North Lindbergh Blvd., C3NF St. Louis, Mo. 63166 (314) 694-1000 RI-O1D

action. Test marketing showed that an expenditure of $40,000 a day (about $2,750,000 for the three-month period) would achieve that desired result in a campaign covering both the U.S. and Canadian market.

The NMC advertising plan will begin this spring, according to NMC Steering Committee Chairman Richard Hutton. Advertising will be focused on Saturdays from late April through May to maximize its effect for all growing zones.

EXPANSION

OMC Lincoln adds large warehouse

OMC Lincoln is building a 102,000-square foot parts warehouse at its manufacturing complex in Lincoln, NE, announced Herbert A. Jespersen, div. manager, vice president Outboard Marine Corp.

Jespersen said that with the addition of the warehouse, all in-process parts storage will be consolidated under one roof. The new facility will incorporate a multi-level, rack-storage system that will expand the firm's present parts warehousing capacity.

The new warehouse will streamline production of products coming on line this year, such as the company's new 72-inch Front Line mower and Mini-Miser electric personnel carrier.

TECHNOLOGY

Nuclear chemistry explains nitrogen loss

Researchers at Michigan State University are using techniques of nuclear chemistry to study the loss of nitrogen applied to soils with the aim of trying to reduce it and thereby make fertilizer use more efficient. About 25 percent of the nitrogen given to soils escapes as gaseous nitrogen or nitrous oxidetrous oxide.

According to Jim Tiedje, professor of crop and soil sciences and microbiology at MSU, less is known about denitrification, the process by which nitrogen is lost to the soil, and a competing process, which conserves nitrogen in a form plants can use, than is known about many other basic biological processes. The tool that has made it possible for Tiedje and his co-workers to begin to unravel these processes is a radioactive isotope of nitrogen produced in the MSU cyclotron.

Michigan State is one of only a handful of institutions in the world using nitrogen-13 for research and one of only two universities in the nation producing the isotope for agricultural studies. Nitrogen-13 is the key to finding out what happens to nitrogen applied to the soil because it makes it possible to trace small amounts of nitrogen as it is transformed by soil microorganisms.

"In our studies of denitrification, use of the radioisotope nitrogen-13 is particularly important," Tiedje says, "because the product, nitrogen gas, must be detected in our atmosphere, which is 80 percent nitrogen. This can be done only if we have nitrogen-13 as a tracer."

Experiments with nitrogen-13 nitrate applied to soil can reveal how much of the nitrogen escapes as free nitrogen or nitrous oxide and what conditions promote or retard this loss.

Continues on page 72

STEPHENSON Chemicals

Announcing a course in the

CONTROL OF WEEDS AND ORNAMENTAL INSECTS AND DISEASES

MARCH 13 & 14, 1980

Stephenson Service/Div. of Stephenson Chem. Co.
2444 West Point Rd.
College Park, GA 30337

The purpose of this course is to offer training in the recognition, biology and control of outdoor pests including the fundamentals of weed identification and control. In addition to providing basic training, the course is designed to cover subject areas specified by EPA for the certification of commercial applicators. Topics include:

- Laws, regulations, labeling and pesticides
- Insects and insect control
- Plant disease and their control
- Weeds and weed control

Instructors are Dr. Harry Pratt and W.E. Blasingame.

For additional information call:
In Georgia 762-0194 (collect)
Outside Georgia toll free 1-800-241-3343

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STANLEY®

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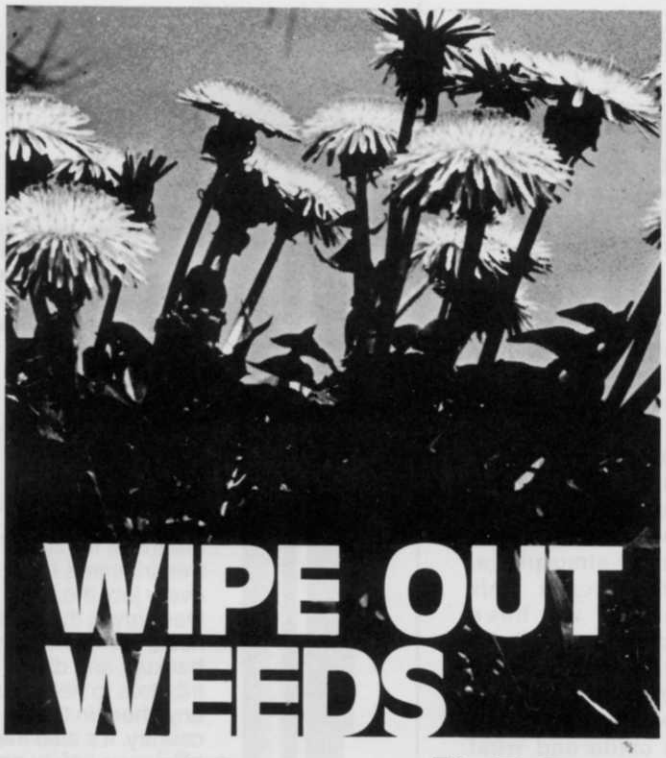

with Banvel® 4S & Banvel®+2, 4D

HERBICIDES

The broadleaf weed 'specialists' designed for professional turf programs.

Here's why BANVEL® herbicides are the professionals' choice for weed control:

- Used as directed Banvel will not harm trees, ornamentals or turf—it just eliminates weeds.
- No season restrictions. Lay down Banvel from early spring to late fall—all through the growing season.
- Rain will not affect Banvel. It keeps on working because it translocates—penetrates leaves and is absorbed through roots to attack every part of the weed.
- No special spraying equipment necessary. It is easy to clean out of equipment after use.
- Mixes readily with hard or soft water.
- Easily stored through winter months without losing potency.

Banvel herbicides—products for professional turf men

Velsicol

VELSICOL CHEMICAL CORPORATION
341 East Ohio Street
Chicago, Illinois 60611

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"Oak becoming a necessity for survival"

There is probably no other tree as useful for shade and a multitude of other needs as the oak, says Charles W. Dunn, executive vice president, Florida Nurserymen and Growers Association.

The live oak (*Quercus virginiana*)has the greatest endurance. It survives disease and insects, wounds from cars, roots cut from water line repairs, and a variety of soils. Live oaks produce strong and massive branches that can withstand even the severest of hurricanes. Many are over two or three hundred years of age.

The massive spread of the live oak can cut energy bills during the summer. Cool breezes beneath its canopy are almost as good as air conditioning. Leaves are shed during late winter to permit warm sunshine on the house. The leaves are excellent for mulching azaleas and other acid loving plants.

SEED

Northrup King names Churchill to manage

Northrup King Co., Minneapolis, MN, has appointed Joe Churchill as assistant manager, Professional Turf Products Div.

In his new position, Churchill will be responsible for supply management of Northrup King turf mixtures and improved grass seed varieties. Prior to this position. Churchill worked at Northrup King's research center in Eden Prairie, MN.

FLOWERS

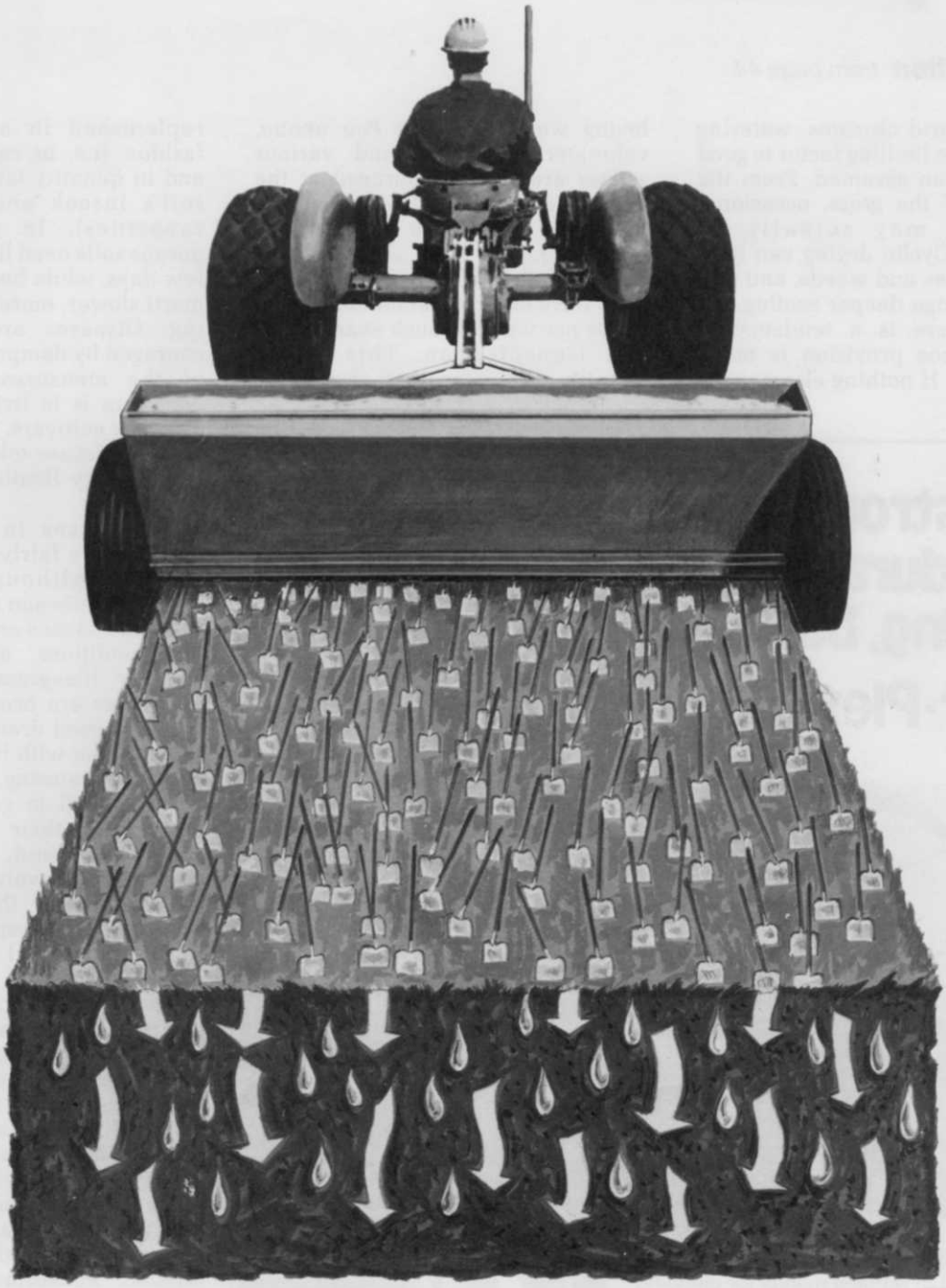
Zinnia ranks at top of flowering annual list

According to the amount of seed sold, zinnia, marigold, petunia, nasturtium, alyssum, aster, morning glory, portulaca, snapdragon, and sweet pear rate as the most popular flowering annuals.

Zinnia, a plant native to Mexico and Central America, is one of the most easily grown annuals for seeding directly into the garden. This, along with the wide range of colors, flower forms, and plant sizes and strong resistance to pests, makes zinnias so popular.

Marigold seeds may also be successfully planted directly into the garden. However, for earlier bloom, plants should be purchased or seeds started indoors. Color of marigolds is limited to yellow and orange shades but many plant forms and sizes are available.

Petunias, which come from Argentina, have extremely small seeds and should be started indoors or purchased as started plants. They are best suited to sunny locations in well-drained soil and have few pests.



Easy way to loosen heavy clay soil! Works like millions of tiny hoes.™

Sof'n-Soil™ Gypsum works its way down to loosen heavy clay soil so it can breathe. Lets air and water penetrate, boosts efficiency of costly fertilizers. Sof'n-Soil, a natural mineral, stimulates vigorous root systems—promotes growth of grass, trees, shrubs, and flowers. Ecologically safe, Sof'n-Soil *is not lime*. It's neutral, non-caustic, non-burning—harmless to plants, pets, and people. And here's the bonus: Sof'n-Soil supplies essential calcium and sulfate sulfur in readily available form, stimulates decomposition of organic materials, too. Write to us at 101 S. Wacker Dr., Chicago, Ill. 60606. **Dept: WTT280.**

CHEMICALS DIVISION

UNITED STATES GYPSUM

Primary Supplier of Secondary Plant Nutrients

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Except in arid climates, watering is not often the limiting factor to good turf, as is often assumed. From the standpoint of the grass, occasional drying out may actually be therapeutic. Cyclic drying can help thwart diseases and weeds, and will likely encourage deeper rooting. All too often there is a tendency to overwater once provision is made for irrigation. If nothing else, water-loving weeds such as *Poa annua*, volunteer bentgrass, and various sedges are then encouraged at the expense of the grass (few grasses are naturally adapted to a constantly soggy soil).

At the height of the growing season most turfs lose only about an inch of water per week through evaporation and transpiration. This is the quantity of water that should be replenished in a common sense fashion (i.e. at rate of application and in quantity tailored to the local soil's insoak and water-holding capacities). In general, sandy, porous soils need light watering each few days, while heavy, clay-silt soils merit slower, more prolonged watering. Diseases are generally encouraged by dampness, although one of the measures for countering *Fusarium* is to irrigate moderately. The new cultivars, most of them with bred-in disease tolerance, are likely to be pretty flexible as to watering schedules.

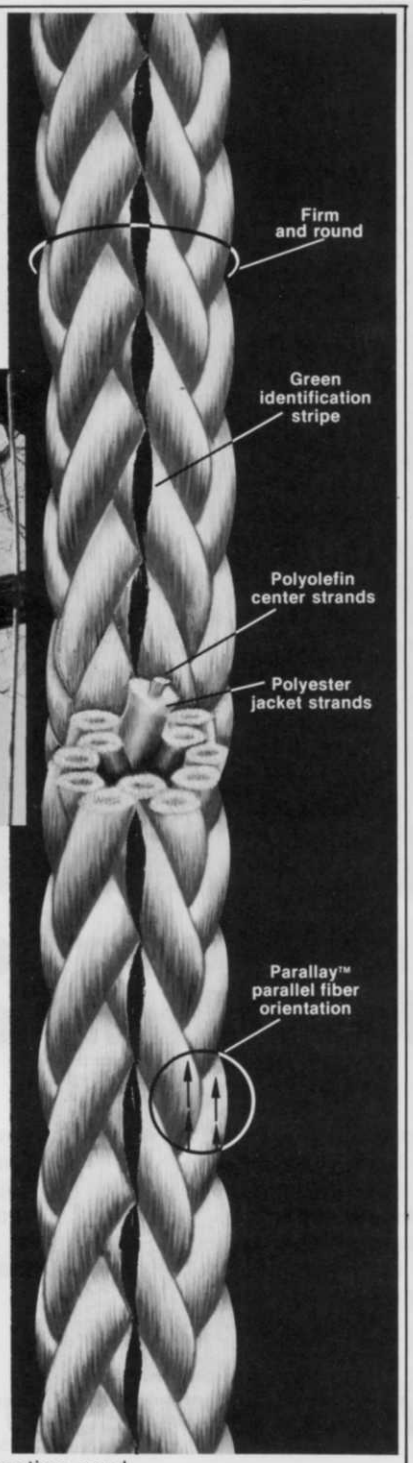
Differences in irrigation preferences are fairly marked between species, although not greatly different between cultivars within a species. Fescues are well-adapted to dry conditions, especially in hot weather; bluegrasses and perennial ryegrasses are broadly tolerant, but "prefer" good drainage; bentgrasses are at home with high humidity and frequent watering. Bermudagrasses respond well to generous watering because of their vigor and rapid growth. Indeed, most southern species have evolved in humid environments so they "appreciate" some irrigation, especially on soils of the sandy coastal plain and in the arid Southwest.

Fertilization—Judicious use of fertilizer is one of the most effective means for encouraging turf (thus discouraging weeds), and enhancing the attractiveness of the lawn. Fertilizers rich in nitrogen are appropriate for a foliage-producing plant such as lawngrass. Most of the time a complete fertilizer (one containing all of the major nutrients — nitrogen, phosphorus, and potassium) is utilized. Potassium is increasingly recognized as important for winter hardiness, general resistance to disease, and sturdy growth. Phosphorus promotes root growth, especially in seedling grass, and helps grass achieve a jump on familiar weeds. Almost invariably nitrogen will be needed in any fertilization program, and a soil test can give guidance as to the necessity for other nutrients.

Simple pH determinations reveal acidity and the need for lime. Lime is often advantageous in regions of heavier rainfall, such as the eastern United States. In recent years sulphur has promoted grass health and retarded weed invasion (noteworthily of *Poa annua*), especially in the Pacific Northwest and

Continues on page 76

New, stronger more durable climbing, bull rope, Arbor·Plex™



Arborplex™ 12-Strand . . . a new Samson rope designed to replace manila for climbing and bull rope. Arborplex has been extensively evaluated in the field and has proven itself with these advantages.

- Twice the strength of manila
- New Duron™ II polyester for more durability
- Firm "nubby" surface for good grip
- Stays flexible, throws well
- Good knot holding
- Resists chemicals and UV, won't mildew

Arbor-Plex is now available through Samson Distributors. Send for descriptive literature and name of local source. Samson, Dept. AP, 99 High Street, Boston, MA. 02110

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A Subsidiary of ENSERCH CORPORATION

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Field-proven systemic spray replaces trimming on hedges, shrubs and ground covers!

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Atrinal®

Spray with Atrinal and you'll reduce hand-trimming time, and labor . . . and in landscaping, time is money!

Spray Atrinal on hedges, shrubs and ground covers and they will require less trimming and pruning and have a more compact shape. Atrinal can also be used to remove unwanted blooms or fruit on certain species. And spraying is faster and easier. Atrinal, now being introduced to the American market, has enjoyed continued success in Europe.

Trust Atrinal. Use it, then watch your labor costs go down as profits go up! Get all the facts. See your distributor or write–Maag Agrochemicals Marketing, ROCHE Hoffmann-La Roche Inc., Nutley, N.J. 07110.

THE LABOR SAVER

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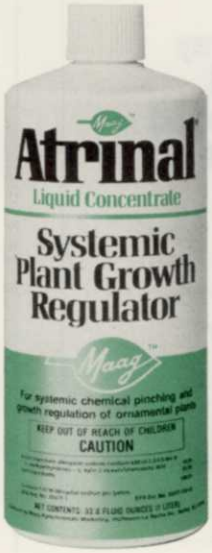
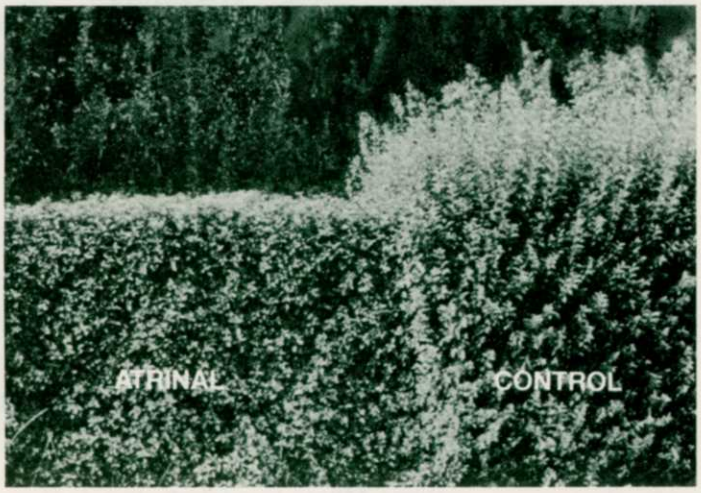
Atrinal®

Liquid Concentrate

Systemic Plant Growth Regulator





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Manually Controlled Safety Clutch Stops Auger Rotation When Operator Releases Lever

Ask about complete Ground Hog line . . . including towable One-Man Earth Drill without torque kick-back.

A new Safety Clutch reduces chances of torque kick-back. A Briggs & Stratton 5 hp 4-cycle engine gives the power and speed needed for the toughest jobs . . . and a heavy duty gearbox with Timken bearings withstands rough drilling abuse. Easily removable handles and auger allow working in tight places or transporting in car trunk.

A great rental item because simple design and rugged construction assure long service life with minimum maintenance. Accepts 2" through 12" augers.

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Only way to total lawn weed control!

Super-D is the formulation that's right for you with broader coverage for your dollar and a broad range of weeds under control.

UNION CARBIDE

AGRICULTURAL PRODUCTS COMPANY, INC.
AMBLER, PENNSYLVANIA 19002

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Turf Selection

from page 74

in Florida. In general, the newer cultivars are more responsive to fertilization than is common grass, the majority of them having been bred and selected for a regimen of care that included fertilization. Moreover, the newer cultivars are on the whole more resistant to disease, so there is not the worry about hot weather forcing (from fertilization and watering) that often wreaks havoc with common grass.

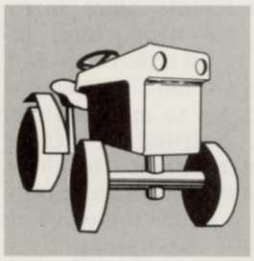
Southern lawns are typically fertilized at spaced intervals throughout the growing season, usually at rates of about one pound of nitrogen to the thousand square feet on each occasion. At one extreme is bermudagrass, a heavy feeder, the other centipedegrass (and perhaps bahia) which resents heavy fertilization. The other southern species fall in between; by and large they perform better and have better color if regularly fertilized. In the North, creeping bentgrasses are perhaps most in need of fertilization among modern lawngrasses, with fescues least demanding. Bluegrass and perennial ryegrass look better when adequately fertilized, and some difference shows up between bluegrass cultivars (Merion, for example, is a heavy feeder, while several other cultivars seem to survive quite well on a light regimen).

The advantage of autumn and early winter fertilization with northern grasses has been recognized in recent years, with only light feeding recommended as spring progresses. In the southern portions of the bluegrass belt, about two-thirds of the fertilizer may be applied in autumn, rather little during the summer (it would benefit weeds then, and perhaps encourage disease with common bluegrass). Even in northerly portions of the bluegrass belt advantage is seen from late season fertilization.

Soil Manipulations - When preparing the soilbed, whether for seed or sod, advantage should be taken of the opportunity to introduce needed nutrients while the soil is being cultivated. Heavily used turf may merit incorporation of amendments, such as high percentages of sand to facilitate drainage, calcined clay, organic materials to bolster aggregation, and so on. In the majority of cases, however, soil treatments other than the mixing of fertilizer are too costly, and a good stand of grass is generally obtainable merely through

Continues on page 78

Quit toying around!



Whether taking care of property is your business, your pleasure, or simply your responsibility, you need the proper equipment to do a proper job.

Satoh tractors are engineered for the optimum blend of power and speed for efficient and economical performance in a complete range of applications. And throughout Satoh's full line of 14 diesel and gas-powered 2 and 4-wheel drive tractors, sized from 15 to 38hp, the features most often demanded by professionals are standard.

For example. Dual-range multi-speed selective sliding gear transmission with differential lock. Power take off with multi-step speed control and integral safety shield around the PTO shaft. Live hydraulic implement control and rugged Category I 3-point linkage. Environmentally-sealed brakes with independent pedals and hinged interlocking plate. Heavy-duty electrical starting system for all-weather dependability. Full instrumentation for instantaneous monitoring of all engine functions. And more.

Your Satoh dealer can show you the complete range of standard features and available options as they pertain to specific models. Such as the 15hp Beaver and the 3-cylinder 16.5hp Beaver III, two of Satoh's compact water-cooled diesels with performance capabilities seldom found in their class. Or the 25hp water-cooled diesel Bull. With 12-speed dual-range transmission, 4-step PTO and simple interchangeability between estate, agricultural or wide turf tires, it's the most efficient and versatile mid-size utility tractor for grounds maintenance or construction applications on the market today.

If you're serious about what you do, forget the toys. And look at Satoh. The professional tractor people.

Satoh. Satisfaction!

Get it at your **SATOH** *tractor dealer. P.O. Box 5020, New York, N.Y. 10022*

Turf Selection *from page 76*

fertilization, sensible mowing, and perhaps watering if needed.

All grasses tend to improve soil as they grow in it, fingering rootlets that are partly recycled each year throughout the top several inches. On some hydrophobic soils wetting agents may help to keep the rootzone moister, or on water-logged ground to facilitate drainage. Applications of sulphur or gypsum may help control iron chlorosis of grass, on alkaline soils of the West high in sodium. Ground limestone for acid soils, and sulphur for highly alkaline ones, are familiar means for adjusting pH (most grasses do best in a mildly acid to neutral medium; bentgrasses and centipede grasses are adapted to more acid conditions, and all species are rather broadly tolerant).

Other Perquisites - The main attentions that generally spell success for turf have been highlighted. Yet special problems do occur, and some are receiving no little attention.

Irrigation water is becoming increasingly expensive and is not always of the highest quality. In the Southwest, particularly, salinity problems arise. Alkalagrass (*Puccinellia*) and saltgrass (*Distichlis*), are adaptions from the plains which withstand relatively high salinity. The species are not competitive where other grasses flourish. Even among the conventional lawngrasses slight differences among species and cultivars show up in ability to withstand saline environments (in California, for example, Fylking showed superior salinity tolerance among bluegrasses).

Thatching of lawns is a modern problem, in which undecomposed tissues accumulate at the base of the sod. Zoysia is notorius for being slow to disintegrate, while in the North fine fescue is more resistant than bluegrass or perennial ryegrasses. With all species, vigorous cultivars produce more vegetative growth (potential thatch) than less aggressive ones. Thatch-formation is influenced by many factors, but in general biological agents have not increased thatch decomposition. A moist thatch environment, as under a light topdressing, of soil, is usually most effective for reducing thatch. The newer cultivars will probably build up thatch a bit more rapidly than common grass, simply because they are dense and vigorous. Occasional dethatching at a season when quick recovery will occur may prove helpful.

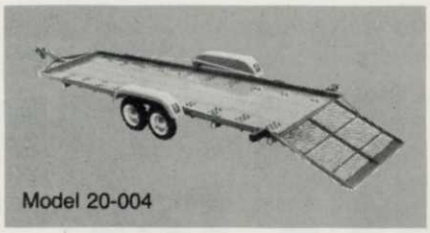
Aerification is advocated for compacted soil. Coring, in which pencils of soil are removed, rather than spiking, during which indentations are made, is generally preferable. It creates avenues for insoak of water and nutrients. The core holes often fill quickly with roots, indicative of favorable oxygenating conditions.

Pesticide treatments were mentioned under weeding, and, of course, extend to insects, fungi and nematodes (eelworms). Impressive new products come to market from time to time, helping to offset buildup of pest resistance to older pesticides. As was mentioned, bred-in pest resistence seems the wave of the future with lawngrasses. A groundswell of interest in integrated pest management (IPM), in which natural controls as well as pesticides play a major role, is also evident.

WTT

Snowco Utility Trailers

...now even more versatile!


Model 20-004

Ideal for hauling grounds maintenance equipment, golf cars and other bulky, hard-to-handle items, the proven Snowco line includes eight flatbed trailers with loading ramps or tilt decks, plus a box bed trailer with tailgate.

The design of the popular ramp loading trailers—with perforated steel decks—has been improved for increased versatility. Three models are offered with capacities of 1,150 and 2,100 pounds.

Five tilt trailers with perforated steel decks are offered with capacities of 1,000 to 3,500 pounds.

The steel box bed trailer—capacity 1,200 pounds, is available with an optional canvas or fiberglass cover.

Model 20-006

Snowco
Division of Beatrice Foods Co.
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There's a good reason why Cushman has been around for such a long time: We build equipment that lasts a long time.

And that's never been more obvious than with our new Front Line rotary mower.

Built for keeps.

The Front Line's 72″ mower deck is made of 12-gauge carbon steel, reinforced and arc welded. It has a multi-disc PTO clutch, direct drive to the deck gear box with a sealed and lubricated shaft drive. The hydrostatic transmission is driven by two continuously engaged "A" section belts with self-adjusting tension.

There's no need to worry about overloading the Front Line's engine. The combination of our high torque engine and specially designed mower deck allows you to mow tall weeds and fine grass.

Superior performance.

The Front Line's cut in fine grass is so smooth, you won't believe it was made with three separate blades. That's because the blades overlap 1½″ to reach every inch of grass in the full 72″ swath. Also, the cutting height is adjustable to eight positions, from 1″ to 4½″ in half-inch increments.

Operating the Front Line couldn't be easier. With individual front wheel brakes, and wheel-type steering controlling a single rear wheel, you get tight maneuverability and better control on varying terrain.

The Front Line's mower deck makes your job easier, too. It extends more than a foot to one side, so you can trim right up to fences or trees. And it lifts hydraulically for transport over curbs. What's more, a large capacity fuel tank lets you work up to 6 hours between refills.

100% Cushman.

Most rotary mowers use engines built by outside suppliers. Not the Front Line. Its 18-hp, air-cooled engine is all-Cushman. So is the differential. And the PTO drive. Which means all parts and service are provided by your Cushman dealer.

Send us this coupon today, and we'll tell you more about the new Front Line: The only mower built Cushman-tough. 80-CUT-5

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More than a game *from page 22*

become certified requires more examinations on such subjects. Lastly, a pesticide mistake results in phytotoxic condition that is embarrassingly evident to everyone including his employers. As a group, the golf course superintendents may be the most experienced and qualified pesticide applicators and hence the safest users of pesticides. This does not mean however, that we should not be concerned about the total volume of pesticide use and all possible side effects. Thus the American Society of Golf Course Architects committee on environmental impact, chaired by an ex-bacteriologist, is preparing a white paper on the subject of golf course impact and will continue to monitor the literature to keep current and present these findings.

In summary, it is not difficult to use loaded words to evoke loaded thoughts about any site or golf course development project. But when each objection is examined in calm reflection, the benefits of the golf course in the landscape far outweigh the detrimental effects.

Having presented all of these facts and observations, it should be clear to even the non-golfer, that golf course development should be encouraged and not simply tolerated. If we introduce the general public to the many positive aspects that golf courses can bring to a community, it would seem logical for them to support any legislation that would permit golf courses to be taxed as open recreational ground and not at their highest and best use. The greatest threat to proposed and existing golf courses today is property taxes, that may be in excess of $100,000/year in some areas. Many clubs simply cannot continue to pay such high rates and are selling their land to developers. In some cities, this problem is so acute that there has been an ordinance passed that says no golf course can be sold for any other purpose but golf until a new golf course of similar size opens. Although there is no pending legislation, we should begin now to encourage others to support fair taxing of golf courses for they are protectors of natural resources.

With the recent passage of Proposition 13 in California thereby reducing private property taxes, it is only natural that increased taxes will be expected from those still available tax sources. To many, the country clubs symbolize the elite and the rich and so little general sympathy will be shown if increased tariffs are levied on the country clubs. Unless some exemptions are made for these clubs, it could spell the end to many.

Having read this article you now have an arsenal of benefits provided by golf courses that should be used to defend their existence. Better yet would be to take the offensive and see if a committee or program of community relations could be set up to more clearly demonstrate the importance of the golf course to its' neighbors. It could be anything from designated wildlife areas or bird houses to a collection of used golf equipment donated to the schools or park systems. The possibilities are endless and successful programs will be noted in golfing publications like this. **WTT**

Climbing *from page 33*

get to them easier," Hawthorne says. "A bucket operator can swing away from a tree and at it from a 40-foot height and 30 or 40 feet away."

"We can get a better perspective than a climber because a bucket truck can be put right against a trunk or the operator can even climb out of it and up the tree if he wants. Often we'll use a bucket truck to take a guy up to the first branch of a tall tree. With 120-foot tulip poplars where the first limb may be 60 feet off the ground, we can get a climber in the tree much easier than trying to throw up ropes and set up ladders."

Although not a frequent job, cavity filling in high sections of trees is something Hawthorne's crew must sometimes do. "Instead of a man sitting in the saddle to dig the cavity out, he can stand in a bucket truck and work. Excavating a cavity can take two or three hours which can be very tiring in a saddle. Depending on the size of a cavity, you may have to make a couple trips up a tree carrying cement, chisels, and other tools."

This seems to sum up much of what Hawthorne thinks is the main advantage of bucket trucks. They are a practical mechanical device which supplement man's abilities. He says, "I would not say a man could trim a tree faster in a bucket truck, but he's not going to get as tired. A bucket truck operator could do more trees without being so winded."

A bucket truck is not for every tree. Hawthorne estimates he can probably get to 35 percent of his trees, but as far as all work goes—takedowns, shaping, pruning, and even spraying—he can use it on 75 percent of the trees in his area. He's received some contracts in towns with a good number of trees that would be too time consuming and costly to do without a lift. A smaller operation with a truck could expand and do many more jobs, he thinks.

Some of the unique jobs he's received because of the bucket lift include decorating Christmas trees, lifting solar panels onto roofs, changing lights in parking lots, raising advertising signs, elevating movie cameras and cameramen to photograph certain scenes, and spraying large areas.

Results are good, business gets better, and Hawthorne finds more things for his bucket truck to do every day. Nobody has compared Hawthorne's trees to Halsted's. One is in the east, one in the west; one uses bucket lifts, one almost exclusively climbs. Both men think they are doing the proper job as arborists. They realize that without the skill, knowledge, and practice, their work and talk would be meaningless. **WTT**

The Chipco® Line. It's growing like grass.

Now you can have a matched set of Chipco herbicides, fungicides, and micro nutrients in your turf maintenance bag. Chipco provides virtually everything you need to keep turf free of troublesome weeds and diseases and promote a good looking, perfectly playable course.

Ask your Chipco distributor about new Chipco® 26019 that outperforms other fungicides with half the number of sprays . . . and Chipco® Ronstar® G that controls crabgrass, goosegrass and poa annua up to 120 days with one early application. And ask him about the advantages of buying everything you need from the entire quality line of Chipco turf products.

Rhône-Poulenc Chemical Company, Agrochemical Division, Monmouth Junction, New Jersey 08852.

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The "Piggyback" Material Handler

It's Powerful ... Safe ... Versatile!

Princeton's mighty "Piggyback" has solved many of the problems that have always plagued heavy-duty, field quality material handlers. The remarkable "Piggyback" is light...strong...fast...durable...**AND** completely stable on the job!

The Piggyback will lift and load up to 4500 lbs. at a time ... turn quickly in its own length ... navigate curbs, logs, and other obstacles with ease...trudge through gravel, sand and mud, but float over normal soil...and then load itself onto your truck for a piggyback ride home at the end of the day.

How is it Possible?

The Princeton "Piggyback" provides an extremely low ratio of weight to carrying capacity...with complete stability. Stability is achieved by carrying the load weight between the drive wheels instead of in front, as with other fork lifts, and by special hydraulic stabilizer legs. Load is lifted to truck bed height, then rolled over truck bed by a horizontal carriage.

Heavy-duty high torque wheel motors allow the "Piggyback" to operate on steep grades or in adverse ground conditions and to drive easily over normal loading area obstructions while fully loaded.

The Piggyback's 28 h.p. Murphy 2-cylinder diesel provides superior power for all adverse operating conditions.

Loaded for Piggyback ride home.

For additional information or demonstration, write, or call collect:

Rodger Osborne, Sales Manager
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Dealer/Distributor Inquiries Invited

The "New Concept" People

princeton mfg. company

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SOD PRODUCER NEWS

Midwest conference accents turf research

"Research and its Applications" will be the theme of the Midwest Regional Turf Conference, scheduled for March 3-5 at the Stewart Center, Purdue University, W. Lafayette, IN.

Monday's general sessions will deal with research and results on nitrogen, fertilization programs, and roots and their functions.

On Tuesday, the program will be divided into topics for private golf, public golf, and lawn care. Some of the golf discussion will concern turf maintenance and energy conservation, sands, rootzones, preemergence and postemergence, and seed supplies. Subjects under the lawn care session include pesticide analysis, promoting and advertising, turf disease and control, and regulation of fertilizer sold.

'Adelphi' bluegrass gets Canada license

Agriculture Canada has granted a license for the Kentucky bluegrass variety 'Adelphi' on recommendations by researchers in Nova Scotia, Ontario, and Western Canada.

'Adelphi' has been chosen by the U.S. Plant Variety Protection Office of the USDA as a standard for dark green color to which all bluegrasses applying for plant protection in the future are compared for color classification. The seed has been found to be very plump (about 1,300,000 seeds per pound) which may account for its vigorous establishment.

J. & L. Adikes, Inc. of Jamaica, NY, under agreement with Rutgers University, own marketing and patent rights on 'Adelphi' and have appointed Rothwell Seeds Limited of Lindsay, Ontario, exclusive distributors in Canada.

New bermudagrass looks promising

Graduate students at Virginia Polytechnic Institute & State University, Blacksburg, are currently conducting studies with a new bermudagrass variety that could soon be commercially available for use on golf course fairways, athletic fields, and in general turf areas.

Among the characteristics observed of this strain, called VPI C-1, are its outstanding vigor and attractive medium-green color. It forms a tight sod that tends to remain weed free and appears to tolerate traffic well.

It survived the severe winters of 1976-77 and 1977-78 at Blacksburg when most of the bermudagrasses in other trial plots were killed.

No mixing, no burning, no hassle.

Introducing FOLIAN®.. the easy-to-use liquid fertilizer that's safe and effective on any kind of turf.

FOLIAN is a complete fertilizer. Its special formulation of N-P-K, sulfur and iron gets nutrients directly into grass tissue. And FOLIAN will not cause tip burn when used as directed.

Convenient to use

FOLIAN is the only turf-builder you'll ever need. It saves you time because there's no mixing or agitation required before using FOLIAN. And FOLIAN can be applied in more concentrated form than most other liquids. As a result, you can service more lawns per truckload with fewer wasted man-hours.

A clear solution of the highest quality, FOLIAN won't settle out in your tanks. It's compatible with most pesticides, too.

Greens lawns fast

Because of its patented formulation and foliar activity, FOLIAN greens up turf quickly—faster than dry fertilizers or suspensions. And at the recommended rates, FOLIAN supplies enough residual fertilizer in the soil to keep grass green and healthy for many weeks.

Good for your business

Your customers will love the results FOLIAN gives. And you'll appreciate FOLIAN's convenience.

Best of all, FOLIAN makes your lawn care service more valuable. It means repeat business from satisfied customers and greater confidence in you.

Give FOLIAN a try and discover how it can mean more green for both of you.

To find out more about how to get started using FOLIAN, call toll-free 800-228-2178 Omaha, Neb., 800-446-1841/800-446-1845 Hopewell, Va. or write Allied Chemical Corporation, Dept. AG, Box 2120, Houston, TX 77001.

Allied Chemical
Plant Foods

Circle **110** on free information card

FOLIAN® complete liquid fertilizer.

PRODUCTS

Piggyback material handler by Princeton Manufacturing Co. will lift and load 4,500 pounds of sod, trees, and other nursery materials. It

carries the load weight between the drive wheels instead of in front to give stability. It provides a low ratio of weight to carrying capacity, and is designed to lift itself off the ground behind any suitable truck for easy, efficient transport. A two-cylinder diesel engine and hydrostatic wheel motors and wheel torque hubs power the machine through all adverse conditions — in mud, sand and gravel; over curbs, logs, and other obstacles; and on steep grades.

Circle 709 on free information card

The RCS-4 row crop sprayer applies liquid chemicals to control weeds and grasses in row crops and sod beds. It spot sprays for application only in infested areas, saving fuel and herbicides. High flotation tires and light weight reduce soil compaction. Twin chemical tanks hold 110 gallons, which can be pumped by either a high-capacity centrifugal pump or a 7-roller pump. Its 48-inch ground clearance is useful for nearly all row crops during the full spraying season.

The Hustler Corp. machine has a 20-foot, three-section, spring-loaded boom for multiple height adjustment for the particular crop. The combina-

tion hydrostatic/differential transmission controls speed (tops is 12 mph) and permits smooth operation at low speeds for wick bar applications.

Circle 704 on free information card

The HT 20 Bolens diesel tractor offers the power of a twin-cylinder 19.9-horsepower cast iron diesel engine along with the easy operation of hydrostatic drive with treadle foot

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The Pick-Up Mower

Mow smoothly and pick up clippings in one pass! The rugged, versatile Lawn Genie thatches lawns, verti-cuts greens, tees and fairways, sweeps leaves, wades through high weeds and empties easily from the tractor. It's the pick-up mower that cleans, mows and sweeps.

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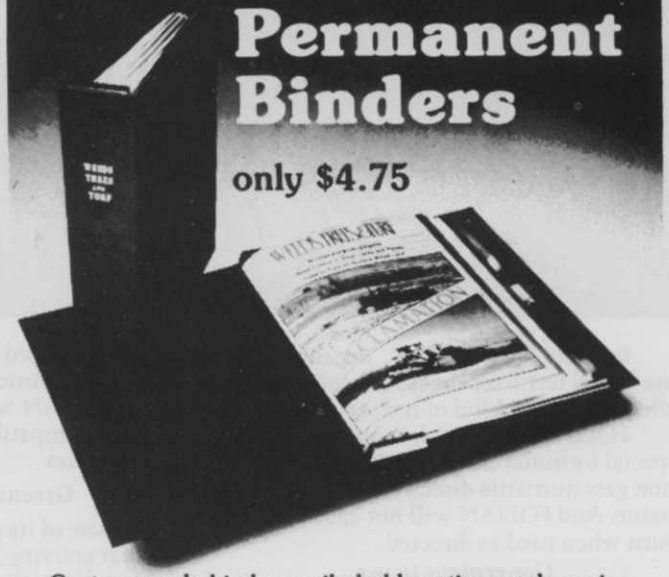

Custom-made binder easily holds entire year's copies of WTT magazine. Green binder with gold embossed logo protects your magazines and gives your library a neat appearance. Magazines can be inserted as they are received. Annual index in December issue makes it easy to find information you need quickly . . . Send check or money order to:

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(Add $1.25 per Binder Shipping Chg.) Allow 6-8 Weeks Delivery.

If you use Chipco® Ronstar® G in April, this won't happen in August.

Crabgrass. It can come back to haunt you! A number of golf courses found out during an unusually wet summer last year. After 60 to 90 days, smack in the middle of the golfing season, they found themselves with a horrendous crabgrass problem all over again. Even though they were using a leading herbicide.

It wouldn't have happened with preemergent Chipco Ronstar G herbicide. It's that simple. One application of Chipco Ronstar G in early spring controls crabgrass in perennial bluegrass, bermudagrass, perennial ryegrass and St. Augustine grass turf for up to 120 days. And it controls goosegrass, annual bluegrass and five other nuisance weeds at the same time. So, while Chipco Ronstar G may cost a little more, the 120 day control is worth every penny, and more.

For more information, see your Chipco distributor or Rhône-Poulenc representative. Rhône-Poulenc Chemical Co. Agrochemical Division, Monmouth Junction, New Jersey 08852.

RHÔNE-POULENC CHEMICAL COMPANY
AGROCHEMICAL DIVISION

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Please read label carefully, and use only as directed.

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Limb Lopper's lightweight, powerful hydraulic tools get the job done faster and with less effort. Shade tree pruner handles up to 2-inch branches, has insulated extension. Powerful pole chain saw for up to 10-inch wood, has insulated extensions. Circle saw with 9-inch blade for high speed cuts has 30-degree angle head. Insulated extensions and chip guard available.

Hand chain saw, beautifully balanced, smooth, quiet operation. Available in 12, 16 and 18-inch bar models.

Combine Limb Lopper high efficiency tools with your existing system–digger-derrick, bucket truck, other mobile equipment or portable power pack. Write or call today for further information.

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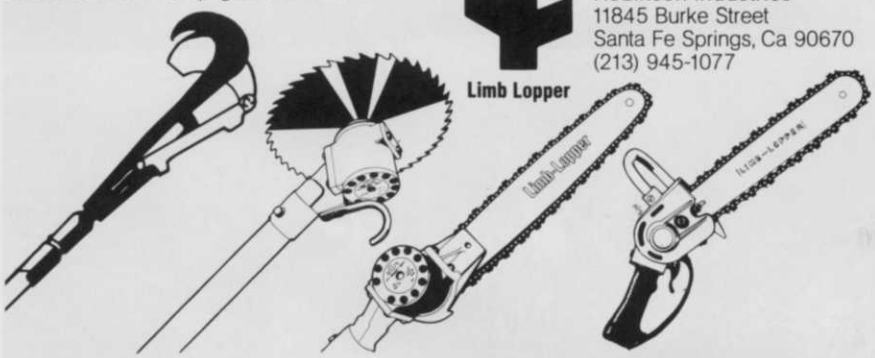

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One reason Durwood Rorie sells so many industrial air cleaners overseas is because he saw the potential. Another is because he used our services.

Durwood G. Rorie, Jr., President, United Air Specialists, Inc., Cincinnati, Ohio.

May we provide some for you?

Write:
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Washington, D.C. 20230.

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Products

from page 84

control. A two-spool "power-lift" hydraulic attachment lift allows the operator to perform two operations at once off a shaft driven PTO for

front, center, and rear mount attachments. The massive two-speed rear axle and differential are built to handle a variety of heavy jobs. FMC Corp., Outdoor Power Equipment Div., makes it.

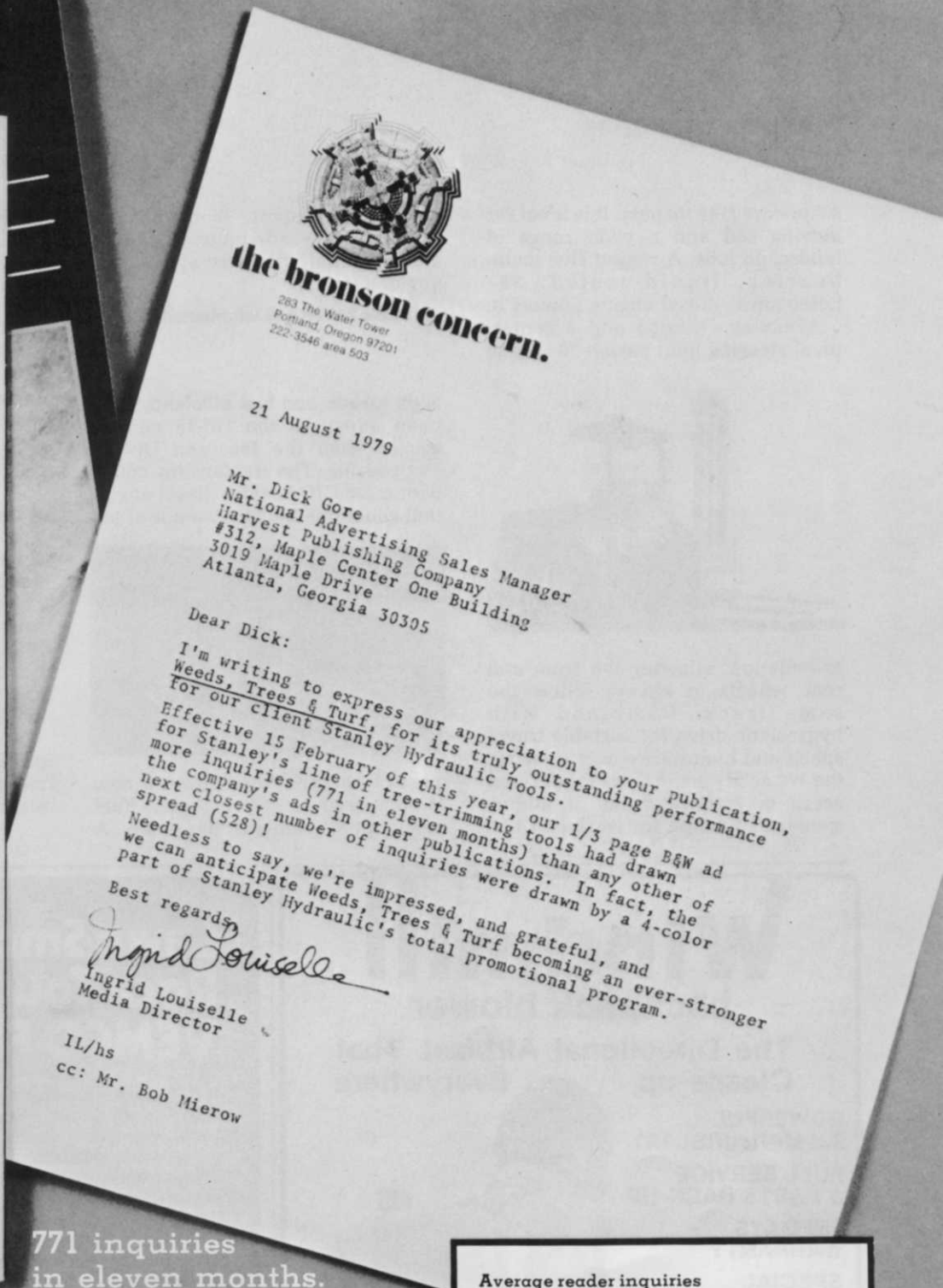
Circle 703 on free information card

The Swinger line of loaders features five models ranging from the 110 with an SAE operating capacity of 1,175 pounds to the 320 with an SAE capacity of 3,012 pounds. All models feature 20 degree front-rear frame

oscillation and fourwheel hydrostatic drive for safe, stable work over rough terrain with full loads. Total 80 degree articulated steering permits easy maneuverability in tight quarters. Dynamic Industries, Inc. makes the loaders.

Circle 708 on free information card

A forklift attachment for the W4 wheel loader, made by the Davis Div., J I Case Co., holds 1,135 kilograms (2,500 pounds) and lifts to



the bronson concern.

283 The Water Tower
Portland, Oregon 97201
222-3546 area 503

21 August 1979

Mr. Dick Gore
National Advertising Sales Manager
Harvest Publishing Company
#312, Maple Center One Building
3019 Maple Drive
Atlanta, Georgia 30305

Dear Dick:

I'm writing to express our appreciation to your publication, Weeds, Trees & Turf, for its truly outstanding performance for our client Stanley Hydraulic Tools.

Effective 15 February of this year, our 1/3 page B&W ad for Stanley's line of tree-trimming tools had drawn more inquiries (771 in eleven months) than any other of the company's ads in other publications. In fact, the next closest number of inquiries were drawn by a 4-color spread (528)!

Needless to say, we're impressed, and grateful, and we can anticipate Weeds, Trees & Turf becoming an ever-stronger part of Stanley Hydraulic's total promotional program.

Best regards,

Ingrid Louiselle

Ingrid Louiselle
Media Director

IL/hs
cc: Mr. Bob Mierow

771 inquiries
in eleven months.

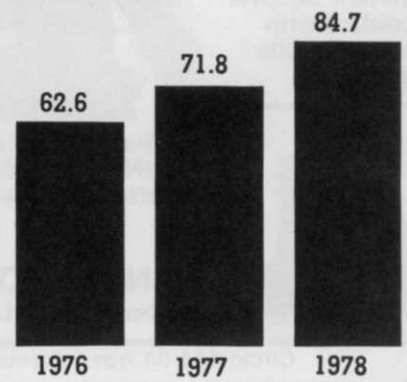
This Stanley one-third page in Weeds Trees & Turf pulled "more inquiries than any other publication . . . Even more than a four-color spread elsewhere"

—Ingrid Louiselle, the bronson concern

Buyers who track advertising performance know Weeds Trees & Turf magazine is highly productive . . . and we think productivity is a mighty important testimonial for media decisions.

Average reader inquiries per display ad placed in WT&T for years shown.

Actual represents 26% gain 1976-1977



Come grow with us. WEEDS TREES & TURF

3.7 meters (144 inches). It is ideal for moving sod and a wide range of landscape jobs. A rugged five main-bearing, liquid-cooled, 35-horsepower diesel engine powers it.

Articulated design and a center-pivot steering joint permit 70 degree

articulation, allowing the front and rear wheels to always follow the same track. Combined with hydrostatic drive for variable travel speed and hydraulic power steering, the W4 easily maneuvers in confined areas or rough terrain. It attains speeds to 4.4 mph for work and 12.7 mph for transport. A hand lever selects forward/neutral/reverse, and a pedal controls speed and power.

Circle 706 on free information card

High torque and fuel efficiency have been added to the HF-15 mowing tractor from the Jacobsen Div. of Textron Inc. The tractor now comes with a 236 CID Perkins diesel engine that generates 192 foot pounds of tor-

que at 1,350 rpm. Horsepower is now 78 compared to 65 previously. Fuel consumption remains the same. A huskier gearbox drive, PTO shaft and U-joint, and clutch have been added along with revised instruments and mowing controls, air cleaners, and exhaust system. This out-front mowing tractor has hydraulically driven reels which allows for reel rotation at a consistent rate, independent of the rotation of mower wheels.

Circle 713 on free information card

A tough, compact grader from Hefty Tractor Co. does a variety of jobs and saves fuel, manpower, and maintenance costs. It has a short turning radius, power steering, and turning brakes for good maneuverability. Blades lift high for clearance and trailer loading. Blades and controls are positioned for operator command.

A blade between the wheels pushes from the solid rear frame mount. Blade angles, lifts, and tilts to either side hydraulically for finish

Continues on page 93

Windmill
backpack blower

The Directional Airblast That Cleans-up Everywhere

POWERFUL 225 MPH AIRBLAST

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SPECIAL FEATURES:
clog-proof air intake
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Lawn Smooth, Rock Tough VEMCO Flail Mowers

Talk about versatile! The Vemco Flail Mower keeps parks, and other large lawn areas smooth and streak-free. It also cuts rocky, trashy areas where ordinary mowers cannot go.

Standard Series mowers, with 42″, 48″ and 60″ widths, have many construction features usually found only on heavy-duty models. Heavy Duty Series, with 60″, 72″ and 84″ widths are tougher yet. Rock Dodger blades swing free in all directions, are practically immune to breakage.

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THE NEW, 4 BILLION YEAR-OLD LAWNCARE DISCOVERY.

Micro-Munch puts life back into lawns with billions of microorganisms to loosen and aerify the soil, and turn compacted mat & thatch into rich humus.

MICRO-MUNCH. A GIANT STEP BACKWARD.

In the beginning, the earth's soil was filled with natural organisms that quickly decomposed organic debris and promoted deep-rooted, healthy vegetation. But over the years, man has destroyed much of this natural balance with over-fertilization, harmful insecticides and machinery that compacted and literally "squeezed" the life out of the soil. All this has led to unhealthy, weak-rooted, problem lawns with thick, unnatural mat and thatch.

To solve the problem, the scientists at Agro-Chem took a long look backward, and developed Micro-Munch as part of their famous Green Magic Lawncare System. Micro-Munch is the first product that actually restores the natural organisms necessary for healthy, lush, disease-resistant turf.

Micro-Munch reduces maintenance costs.

By restoring nature's balance, spray-applied Micro-Munch can actually lower your maintenance costs by reducing the need for fertilizing, watering and pesticide application. And Micro-Munch will eliminate the need for Power Raking and frequent reseeding and resodding.

Micro-Munch works fast and is easy to apply.

Once applied, Micro-Munch's balanced soil diet goes right to work, naturally decomposing harmful accumulated mat and thatch-up to ¾" within 9 to 12 weeks—turning it into nutritious humus. And Micro-Munch sprays on quickly, for noticeable results in weeks.

New Turf Begins With a Phone Call. Or A Stamp.

To find out how Micro-Munch can work to restore lush new life to your grounds, and actually reduce maintenance costs, return the attached coupon. Or for faster service, call us collect. Micro-Munch. It's an idea who's time has come.

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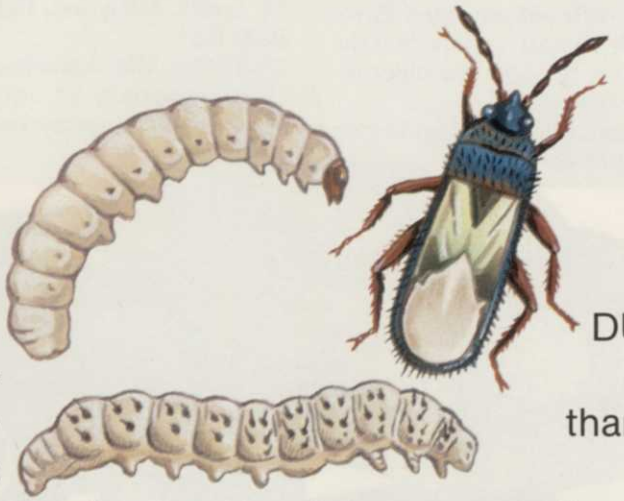

DURSBAN* brand insecticides provide unsurpassed residual control of cutworms, chinch bugs, sod webworms, and a dozen other turf pests. Both DURSBAN 2E Insecticide and double-strength DURSBAN 4E Insecticide keep working a lot longer than other turf insecticides. This residual action saves you time, trips, and labor. It also saves you money. In fact, DURSBAN insecticides cost less than most other turf insecticides. Ask your supplier for the turf insecticide that works overtime for you. Get DURSBAN 2E Insecticide or double-strength DURSBAN 4E Insecticide. Just be sure to read and follow all label directions and precautions. Agricultural Products Department, Midland, Michigan 48640.

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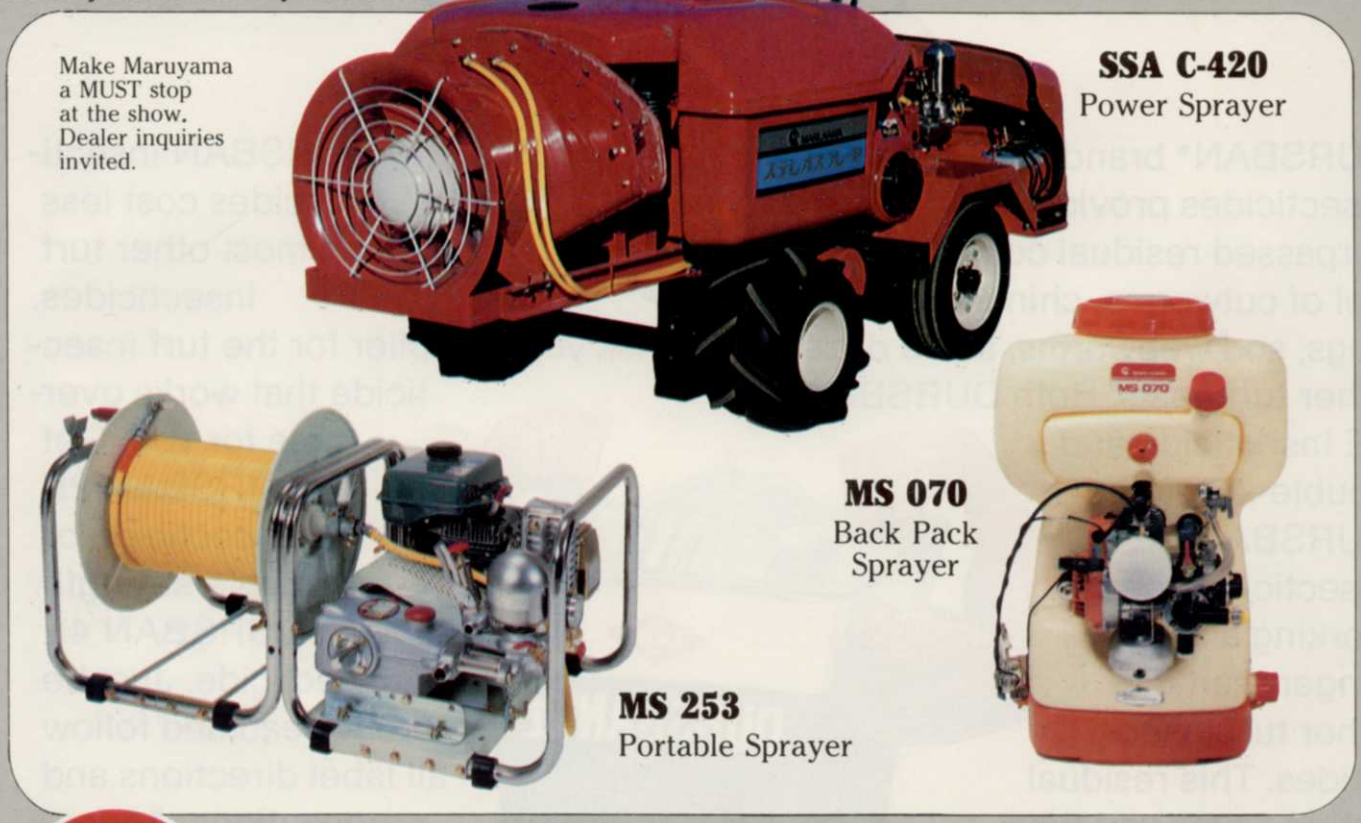
GCSAA 51st International Turfgrass Conference and Show,
St. Louis, Missouri, February 19, 20, and 21, Booths 933/934.
The 1980 Mid America Show, Columbus, Ohio, February 24 and 25, at the Van Atta Seed Company booth.



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grading. A 27-horsepower, water-cooled engine and six speed forward

all-gear transmission power the tractor.

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The three-wheel Front Line mower from OMC-Lincoln makes uniform cuts with three separate blades adjustable to eight positions, from 1 to 4½ inches. Designed for maintenance contractors and lawn care experts, the mower carries a 72-inch cutting deck which extends more than a foot to one side for close trimming along fence lines or around trees. The blades—25 inches long, 2½ inches wide, and 3/16 inch thick—overlap 1½ inches to assure even cutting.

The cutting deck is constructed of 12-gauge carbon steel and reinforced

and arc welded to withstand difficult cutting jobs. It lifts hydraulically to clear curbs. A Cushman 18-horsepower twin, air-cooled, four-cycle engine powers the mower to keep blade speed high, even through tall weeds and grass. Hydrostatic transmission and multi-disc PTO clutch makes it easy to operate. A rocking pedal enables the operator to move the mower into forward speeds of up to 7.7 mph and reverse speeds of 4 mph.

The mower has direct drive to the deck gear box and features a sealed and lubricated telescopic drive shaft for durability. It also has individual wheel brakes for tighter turns and better control on various terrain, and an integral brake locking system for use during transport. Rear-wheel steering enhances maneuverability.

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A 21-horsepower engine, model KT21, from Kohler Co. powers a variety of equipment—lawn and garden, construction, and agricultural. The air-cooled, four-cycle, twin-cylinder engine has demountable

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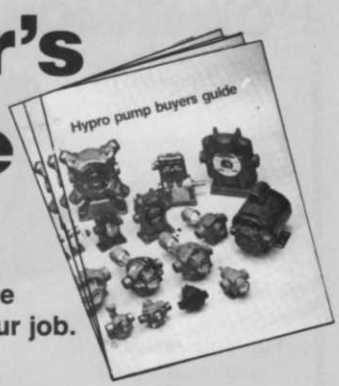
Free Pump Buyer's Guide



Things you need to know to pick the right pump for your job.

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Products *from page 93*

cast iron cylinder barrels on an aluminum crankcase. Crankshafts are made of forged steel and camshafts of durable cast iron.

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reducing air intake noise. The engine is designed for easy installation in an enclosure to further reduce noise. Breaker points, condenser, spark plugs, oil fill, dipstick, air cleaner, and carburetor are easily accessible for service.

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Bush Hog 2400 QT and 3400 QT front end loaders fit many tractor makes and models. Designed to mount or dismount in four minutes, they attach to compact mounting brackets that remain out of the way in normal tractor operation or maintenance. The 2400 QT loader fits 35- to 75-horsepower tractors. It has a lifting capacity of 2,400 pounds and breakaway capacity of 3,340 pounds. Features include a standard level indicator, single frame cross member for good visibility, regreasable pivot points for long life, and tubular hydraulic system.

The 3400 QT loader (shown) fits 80- to 120-horsepower tractors. Its lifting capacity is 3,500 pounds and breakaway capacity 5,000 pounds. Features include rust-resistant, chromeplated, high-tensile steel cylinder rods and V-type piston packing that withstands weather.

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POWERMOW

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WT&T CLASSIFIEDS

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, Dorothy Lowe, Box 6951, Cleveland, Ohio 44101.

Rates: All classifications 65¢ per word. Box number, $1. All classified ads must be received by Publisher the 5th of the month preceding publication date and be accompanied by cash or money order covering full payment. Mail ad copy to: Dorothy Lowe, Weeds, Trees & Turf, P.O. Box 6951, Cleveland, Ohio 44101.

POSITION WANTED

EXPERIENCED AND EDUCATED turfgrass manager and forester desires position with state, county, or municipal government park and/or golf course in mid to far west. BS in Forestry and certified in Turfgrass. 3 years as assistant superintendent of a golf course. 2 years as sod farm manager. Resume upon request. Write Box 237, Weeds, Trees & Turf, Box 6951, Cleveland, Ohio 44101.

CAREER-ORIENTED MAN, 25, excellent educational and professional background, seeks opportunity with progressive, quality-oriented organization. Extensive background in Woody Ornamentals, Plant Pathology, Landscape Maintenence, and Retail Management. A.S. Ornamental Horticulture, Temple University 1978, B.S., Penn State, Feb. 1980. Proven leadership abilities. Contact: Joseph M. Ascenzi, 677 Jackson Ave., Ardsley, Penna. 19038. 215 884-1943.

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WANT TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. McKay Golf & Country Club Properties, 15553 N. East St., Lansing, Michigan 48906. Phone 517 484-7726.

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MANAGEMENT POSITION—Industrial Weed Control (Sales & Service). Rapidly expanding Pest Control company seeks qualified individual with ambition for management position of Industrial Weed Control Division in the New England area. B.S. in Agronomy, Forestry or related subjects preferred. Applicant must be sales oriented. Salary range open and benefits offered. Send resume and salary requirements or call A-1 Exterminators, Industrial Weed Control Div., Gary B. Weisberg, 183 Shepard Street, Lynn, Massachusetts 01902. 617 592-2731.

SOD FARM MANAGER—New York state 250 acre sod farm has opening for person experienced in all phases of sod production and harvesting. Background in horticulture or agronomy desired but not essential. Excellent compensation and benefits for qualified person. Send complete resume to Box 236, Weeds, Trees and Turf, Box 6951, Cleveland, Ohio 44101.

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ence with national or regional lawn care companies, or knowledge of turfgrass and ornamental plants. The right people will have unlimited advancement potential. Send complete resume including education, experience and salary history to: Environmental Lawn Care, 7544 Harwin, Houston, Texas 77036 or call collect 713 784-1750.

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FOR SALE: Tree/lawn sprayer components, all new; 1-Bean 20-20 500 psi pump, 1-Kohler cast iron 12 h.p. electric start, 1-275 gallon s.s. tank. $1500. w/used hose and guns. P.O. Box 548, N. Kingstown, RI 02852. 401 294-6397.

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HI-RANGER 54' and other aerial buckets. 2 Asplundh brush chippers, Prentice hyd. loader, chipper truck, John Bean 20 g.p.m. sprayer, 4 & 9 ton tag-along trailer. Allied Enterprises, Inc., W204 N11509 Goldendale Rd., Germantown, Wi. 53022. Phone 414 255-6161.

HI-RANGERS AERIAL BASKETS 65', 57', 53'. Skyworkers aerial baskets 65', 50', 40'. Vermeer stump cutter 1560, 6. Vermeer tree spade 66, TS 44. Asplundh bucket and brush chippers. Bean sprayer, 9 ton trailer. Parkway Tree Service, 12026 W. Cherry, Wauwatosa, Wisc. 53226. 414 257-1555.

BRUSH CHIPPERS, used Asplundhs, Hydro-Axs and bucket trucks. Lease or for sale. Large inventory available. Call or write P. C. Gould Sales Company, Plains Road, Essex, Conn. 06426. 203 767-1636.

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WT&T

EVENTS

The current issue of WEEDS TREES & TURF carries meeting dates beginning with the following month. To insure that your event is included, please forward it, 90 days in advance, to: WEEDS TREES & TURF Events, 9800 Detroit Ave., Cleveland, OH 44102.

Great Lakes Park Training Thirty-Fourth Annual Institute, Pokagon State Park, Potawatomi Inn, Angola, IN, **Feb. 24-28.** Contact Dr. Richard Lawson, Indiana University, HPER bldg. Room 133, Bloomington, IN 47405, 812/337-4711.

Pennsylvania Turfgrass Conference, Hershey Motor Lodge and Convention Center, Hershey, PA, **Feb. 26-29.** Contact: Arthur Wick, P.O. Box 362, Sewickley, PA, 15143 or Christine King, Pennsylvania Turfgrass Council, 412 Blanchard St., Bellefonte, PA 16823.

Connecticut Groundskeepers Association, Conference, Hartford Civic Center, Hartford, CT, **Feb. 27.** Contact: Glenn Moore, 141 Hemlock Hill Rd, New Canaan, CT, 06840.

International Erosion Control Association Conference XI, Del Webb's Townhouse, Phoenix, AZ, **Feb. 28-29.** Contact International Erosion Control Association, P.O. Box 807, Freedom, CA 95019.

Iowa Turfgrass Conference, Des Moines Hilton Inn, Des Moines, IA, **Mar. 3-5.** Contact: Ed Cott, Dept. of Horticulture, Iowa State University, Ames, IA, 50011.

Midwest Turf Conference, Stewart Center, Purdue University, **Mar. 3-5.** Contact: W.H. Daniel, Dept. of Agronomy, Purdue University, W. Lafayette, IN 47907.

12th Annual Professional Turf and Plant Conference, Salisbury Restaurant, Eisenhower Park, East Meadow, Long Island, NY, **Mar. 4.** Contact Waldemar Solovieff, 63 Central Ave., Amityville, NY 11701.

49th Fine Turf Conference and 4th Industrial Show of the University of Massachusetts, Civic Center, Springfield, MA, **Mar. 4-6.** Contact Dr. Joseph Troll, Plant and Soil Sciences, Stockbridge Hall, University of Massachusetts, Amherst, MA 01003, 413/545-2353.

Ninth Vertebrate Pest Conference and ASTM Symposium, Hilton Hotel, Fresno, CA, **Mar. 4-7.** Contact: Jerry Clark, 1220 N. Street, Room A-357, Sacramento, CA 95814.

Canadian Turfgrass 31st Annual Show, Skyline Hotel, Toronto, Canada, **Mar. 9-12.** Contact: Canadian Golf Superintendents Association, 698 Weston Rd., Suite 32, Toronto, Ontario, Canada, M6N 3R3, 416-767-2550.

Northeastern Forest Pest Council Meeting, Holiday Inn Downtown, Portland, ME **Mar. 11-12.** Contact: James Nichols, Bureau of Forestry, 34 Airport Drive, Middletown, PA, 17057.

National Lawn Care Business Conference and Trade Show, Red Carpet Hotel, Milwaukee, WI, **Mar. 16-19.** Contact Lawn Care Conference, Box 1936, Appleton, WI 54913, 414/733-2301.

Rocky Mountain International Society of Arboriculture Workshop on Urban Forestry and Shade Tree Evaluations, Raintree Inn, Colorado Springs, CO, **Mar. 17-19.** Contact Ron Morrow, City Forester, 1400 Glen Avenue, Colorado Springs, CO 80905, 303/471-6640.

Landscape Industry Show of the California Landscape Contractors Association, Long Beach Convention Center, Long Beach, CA, **Apr. 3-4.** Contact Robyn Casey, CLCA Landscape Industry Show, 3617 W. MacArthur Blvd. 500, Santa Ana, CA 92704, 714/979-2522.

Southern California Turf & Landscape Annual Institute, Anaheim Convention Center, Anaheim, CA, **Apr. 8-9.** Contact Ed McNeill, Executive Secretary, Southern California Turfgrass Council, 1000 Concha St., Altadena, CA 91001, 213/798-1715.

Garden Symposium, Williamsburg, VA, **Apr. 13-16.** Contact Mrs. Peggy W. Sabol, Registrar, The Colonial Williamsburg Foundation, Williamsburg, VA 23185, 804/229-1000.

EPA Conference on Waste-to-Energy Technology Update, 1980, Cincinnati, OH, **Apr. 15-16.** Contact Ruth Anne Gibson, Battelle's Columbus Laboratories, 505 King Ave., Columbus, OH 43201, 614/424-5532.

New Jersey Recreation and Park Association Annual Conference, Golden Eagle Inn, Cape May, NJ,

Apr.27-29. Contact Gary J. Forbes, President, 530 Turnpike, Pompton Plains, NJ 07444

Les Floralies Internationales de Montreal, May 17-29. Contact Les Floralies Internationales de Montreal, Dommissiare General, 360 Rue St-Jacques, Suite 310, Montreal, Quebec, Canada, H2Y 1P5.

Kentucky Cemetery Association Annual Meeting, Executive Inn, Louisville, KY, **June 12-14.** Contact Lewis C. Tingley, Resthaven Memorial Park, P.O. Box 18066, Louisville, KY 40218, 502/491-5950.

NRPA National Forum for Board/Commission Members, Bettendorf, IA, **June 12-15.** Contact Ted Flickinger, NRPA, 600 E. Algonquin Rd., Des Plaines, IL 60016, 312/297-6260.

Residential Landscape Design Course I, Milwaukee, WI, **June 18-20.** Contact John Shaw, Executive Director, ALCA, 1750 Old Meadow Rd., McLean, VA 22101, 703/893-5440.

Residential Landscape Design Course I, Tucson, AZ, **June 23-25.** Contact John Shaw, Executive Director, ALCA, 1750 Old Meadow Rd., McLean, VA 22101, 703/893-5440.

Residential Landscape Design Course II, Phoenix, AZ, **June 26-28.** Contact John Shaw, Executive Director, ALCA, 1750 Old Meadow Rd., McLean, VA 22101, 703/893-5440.

Western Regional Grounds Maintenance and Equipment Show Second Annual, Bear Creek Park, 21st and Argus, Colorado Springs, CO, **Aug. 26.** Contact Frank Cosgrove, Regional Director, National Recreation and Park Association, 3500 Ridge Road, P.O. Box 6900, Colorado Springs, CO 80934.

6th Annual Garden Industry of America Conference & Trade Show, Convention Center, Baltimore, MD, **Sept. 12-14.** Contact Garden Industry of America Conference & Trade Show, box 1092, Minneapolis, MN 55440, 612/374-5200.

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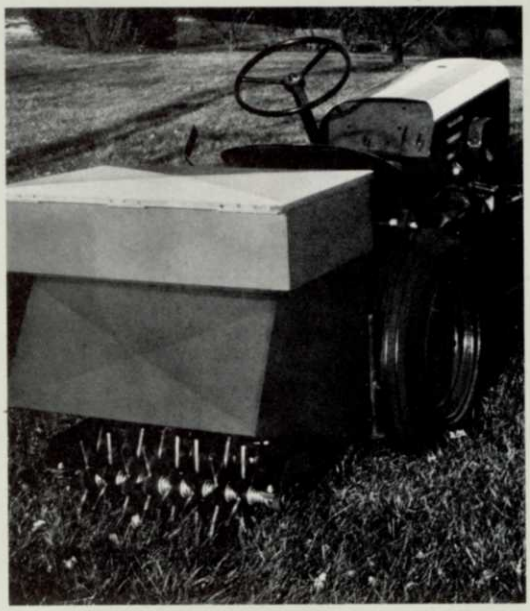

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Trac'n Combo

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Illustration of Trac'n Combo mounted on any tractor does not imply tractor manufacturer's endorsement of the unit.

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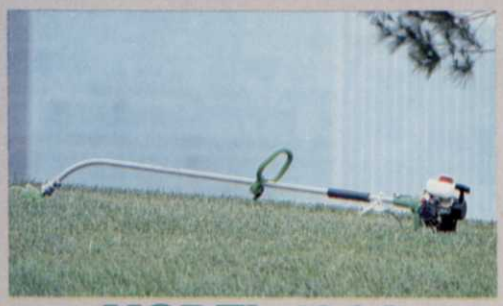


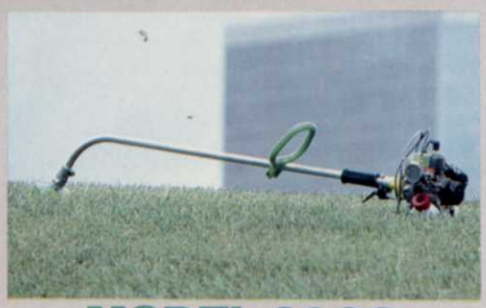
MODEL 1900
High-quality economy trimmer.

Here is famous Green Machine quality and performance built into a new, low-priced 14.9 cc gas-trimmer. Unlike many low-end gas trimmers, The Green Machine Model 1900 has plenty of power—so much power that it comes equipped with two heavy-gauge long-wearing .080 Green Line cutting strings.

Coupled with great engine performance is a simple but effective 2-string, manual-feed cutting head. A TFC™ automatic-feed head is available as an option, as well as a new flexible rubber blade for fast trimming of weeds. Other features of the 1900 include a flexible, enclosed drive shaft, light overall weight for ease of operation, multi-position molded handle.

SPECIFICATIONS:

Engine Type: Inverted 2 Cycle Air Cooled **Cylinder Type:** Single Alum. Alloy Chrome Plated **Displacement:** 14.9 cc **Bore & Stroke mm** 27 x 26 **Compression Ratio:** 6.2:1 **Max H.P. (H.P/RPM)** .65/6500 **Carburetor:** Butterfly Type All Position **Ignition:** Contact Point Type **Clutch Housing:** Direct Coupled **Lubrication (Fuel Mixture)** 20 to 1 **Fuel Capacity:** (.4L) 42Qt. **Shaft:** Flex Type **Reduction:** None **Cutting Head (Std):** 5" Dia. **Cutting Swath:** 17 in. **Weight (with cutting head)** 10 lbs (4.5kg)

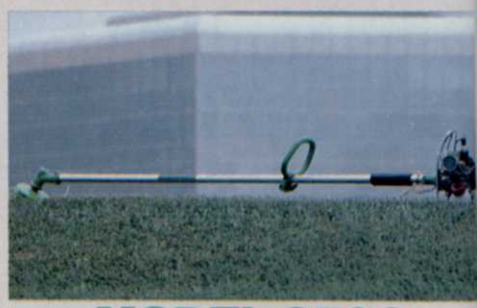


MODEL 2000
Loaded with Power.

This model is equipped with the popular 22.5 cc Green Machine engine. There's power to spare for the toughest string trimming operations. Standard equipment includes the reliable, manual-feed head. You can also use it with the optional TFC™ Tap-For-Cord head. A light tap on the ground automatically releases fresh cutting string. The Model 2000 can also be used with the new fixed-line head (.105 line). Other features include an all-position diaphragm-type carburetor with positive fuel shut-off. Power is transmitted through a rugged, enclosed flexible drive-shaft. As with the 1900, the mid-handle is easily adjustable to the operators height and can be quickly reversed when the unit is used for edging. It's a beautifully built unit, ideal for those that want additional power and efficiency.

SPECIFICATIONS:

Engine Type: Upright 2-Cycle Air Cooled **Cylinder Type:** Single Alum. Alloy Chrome Plated **Displacement:** 22.5 **Bore & Stroke mm:** 32 x 28 **Compression Ratio:** 6.5:1 **Max H.P. (H.P/RPM)** 1.2/6500 **Carburetor:** Slide Type All Position **Ignition:** Contact Point Type **Clutch Housing:** Direct Coupled **Lubrication (Fuel Mixture)** 20 to 1 **Fuel Capacity:** (.6L) .64Qt. **Muffler:** Spark Arrestor **Shaft:** Flex Type **Reduction:** None **Cutting Head (Std)** 5" Dia. **Cutting Swath:** 18 in. **Weight (with cutting head):** 11 lbs (5kg)



MODEL 2500
A great string trimmer—and more.

Powered by the proven 22.5 cc engine, her is a string trimmer—that's more than a strin trimmer. Model 2500 comes equipped with a new Universal TFC™ head for fast, efficient grass and weed trimming. Just switch to one of the optional quick-change metal blades and you've got a great brush cutter or tree pruner. The performance of this unit in tough brush and pruning operations has to be seen to be fully appreciated. The brush blade lets you cut through heavy brush and vines up to ¾ inch in diameter. The saw blade, used with a combination chopping/sawing action can slice easily through branches up to three inches in diameter. It is equipped with a straight solid steel shaft with spiral-bevel gears. Four optional heads are available for this unit—se chart on back page.

SPECIFICATIONS:

Engine Type: Upright 2-Cycle Air Cooled **Cylinder Type:** Single Alum. Alloy Chrome Plated **Displacement:** 22.5 **Bore & Stroke mm:** 32 x 28 **Compression Ratio:** 6.5:1 **Max H.P. (H.P/RPM)** 1.2/6500 **Carburetor:** Slide Type All Position **Ignition:** Contact Point Type **Clutch Housing:** Direct Coupled **Lubrication (Fuel Mixture)** 20 **Fuel Capacity:** (.6L) .64Qt. **Muffler:** Spark Arrestor **Shaft:** Solid type 8mm **Reduction:** 1.26 Gear Drive **Cutting Hea (Std)** 5" Dia. Universal TFC **Cutting Swath:** 18 in. **Weight (w cutting head):** 13 lbs (5.9kg)

★ **Blades and blade guards shown in top photo are optional items**

★ **Fuel mixture ratios shown in specifications are with conventional 2-cycle oils. For convenience and long engine life we recommend ONE-MIX™, the great new multi-ratio**

een Machine®

Commercial-quality TFC™ Tap-For-Cord head equipped with Green Line extra long-life nylon string. (Model 3000SS, as well as 2500, 4000, and 4500, also accept metal blades for brush cutting and tree pruning.)

MODEL 3000SS

The Pro's Choice.

This Green Machine has set the standard for commercial-quality trimmers. Thousands are in use by professional gardeners, grounds maintenace crews, and large-acreage owners. The 3000SS has been made even better with a new, more powerful engine and solid-state ignition. Like the 2500, these units can also be used for brush cutting and tree pruning, using the accessory metal blades. Model 3000SS comes equipped with the commercial quality TFC™ Tap-For-Cord string trimmer head—the first automatic-feed head built for the professional. Other heads available include the ultra-simple, 2-string (.105) manual head designed specifically for rental-yard and other special uses. Quality features include: solid, heat-treated drive-shaft and spiral-bevel gears; anti-vibration clutch housing with dual bearings; larger, quieter muffler and air cleaner; larger gas tank.

SPECIFICATIONS:

Engine Type: Upright 2-Cycle Air Cooled **Cylinder Type:** Single Alum. Alloy Chrome Plated **Displacement:** 24.1 **Bore & Stroke mm:** 32 x 30 **Compression Ratio:** 6.5:1 **Max H.P. (H.P/RPM):** 1.3/6500 **Carburetor:** Slide Type All Position **Ignition:** Solid-State-Transistor Type **Clutch Housing:** Anti-Vibration **Lubrication (Fuel Mixture):** 25 to 1 **Fuel Capacity:** (.7L) .74Qt. **Muffler:** Spark Arrestor **Shaft:** Solid type 8mm **Reduction:** 1.26 Gear Drive **Cutting Head (Std):** 6" Dia. TFC **Cutting Swath:** 18 in. **Weight (with cutting head):** 15 lbs (6.8kg)

MODEL 4000

The high-production trimmer, brush cutter.

This is the high powered Green Machine designed specifically for specialized, day-after-day trimming of grass, weeds, and brush. A harness with hip-pad and wide handle bars provides maximum operator efficiency for such demanding operations as highway road-side maintenance. The 37.4 cc easy-starting engine has power to spare to operate the commercial TFC™ head with .105 cutting string. Other heavy-duty features include larger drive shaft and larger spiral-bevel gears. With accessory blades, the swiveling center shaft of the 4000 makes it ideal for hillside brush cutting and pruning of low-hanging tree branches.

SPECIFICATIONS:

Engine Type: Inverted 2-Cycle Air Cooled **Cylinder Type:** Single Alum. Alloy Chrome Plated **Displacement:** 37.4 **Bore & Stroke mm:** 38 x 33 **Compression Ratio:** 9.1:1 **Max H.P. (H.P/RPM):** 2.7/7500 **Carburetor:** Slide Type Float **Ignition:** Contact Point Type **Clutch Housing:** Direct Coupled With Swivel **Lubrication (Fuel Mixture):** 20 to 1 **Fuel Capacity:** (1.1L) 1.17Qt. **Muffler:** Spark Arrestor **Shaft:** Solid 10mm **Reduction:** 1.26 Gear Drive **Cutting Head (Std):** 6" Dia. TFC **Cutting Swath:** 20 in. **Weight (with cutting head):** 21 lbs (9.5kg)

MODEL 4500

The Green Machine Forestry unit.

Modern forestry practice demands fast, efficient tree and brush clearing. Here is the tool for the job. Using a combination chopping-sawing action, saplings up to 4 inches in diameter can be felled in a single stroke. One man equipped with the 4500 becomes a formidable system of forestry maintenance. This unit is specially-designed to withstand the continuous side-shock impact imposed by this type of work. Extra anti-vibration features as well as an exceptionally heavy-duty shaft are included. The special handle guards help protect the operator. The 4500 comes equipped with brush blade, saw blade and blade guard. The commercial quality TFC™ Tap-For-Cord head is available as an option.

SPECIFICATIONS:

Engine Type: Inverted 2-Cycle Air Cooled **Cylinder Type:** Single Alum. Alloy Chrome Plated **Displacement:** 37.4 **Bore & Stroke mm:** 38 x 33 **Compression Ratio:** 9.1:1 **Max H.P. (H.P/RPM):** 2.7/7500 **Carburetor:** Slide Type Float **Ignition:** Contact Point Type **Clutch Housing:** Direct Coupled With Swivel **Lubrication (Fuel Mixture):** 20 to 1 **Fuel Capacity:** (1.1L) 1.17Qt. **Muffler:** Spark Arrestor **Shaft:** Solid 12mm **Reduction:** 1.26 Gear Drive **Cutting Head (Std):** Blades **Weight (with cutting blade):** 22 lbs (10kg)

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EXCEL HUSTLER 402
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The first 4-wheel drive 72" out-front-cut mower has a fan club: operators who mowed roadside berms and hilly parks during its first year in the field.

They rave about its self-leveling operator station and engine platform, and how it crawls in and out of ditches.

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